Lesson 10: "Modeling a Membrane"

(associated with EiE® story *Juan Daniel's Fútbol Frog*, Chapter 6)

Lesson Topic: Learning about the engineering design process, the scientific method, and Juan Daniel's engineering design process

DESIRED RESULTS (教学目标)

Academic Content Objectives: Students can…

Chinese Language Arts

- Summarize a story's setting, characters, and problem
- Write a statement about membranes
- Make predictions about *Juan Daniel,* Chapter 6
- Demonstrate reading comprehension by answering literal, inferential, and interpretive questions
- Skim and scan *Juan Daniel*, Chapter 6 for information about the Engineering Design Process
- Identify correct usage and functions of punctuation such as period, question marks, quotation marks, and exclamation points

Science and Engineering

- Relate the Scientific Method to the raisin experiment
- Sequence the steps of the Engineering Design Process
- Compare and contrast the Scientific Method and Engineering Design Process
- Relate the five steps of the Engineering Design Process to a series of events described in *Juan Daniel*, Chapter 6
- Identify characteristics of "model"
- Define "model"
- Use a compare-contrast chart to organize key information

Social Studies and Culture

- Compare cultural practices for greeting and leave-taking in El Salvador, the US and China
- Understand how to use a well and carrying vessel (tecomate or 葫芦)
- Explain the importance of water conservation in El Salvador
- Compare water carrying vessels across Chinese, Salvadoran, and US cultures

Learning Strategies: Students can…

- Answer questions about a story using evidence from the text to support their answer
- Work cooperatively with a group
- Sequence steps in a process

Adaptation of EiE® story *Juan Daniel’s Fútbol Frog*, Chapter 6

Chinese Language Objectives: Students can...

Functions and Forms

Content-obligatory (CO)

- Identify and construct semantic radicals as separate characters or as part of another character
- Give emphasis to the specific direct object by using 把 or 让/使 construction and placing the direct object before the verb
- Ask and answer questions using question words
- Give reasons for actions/choices/preferences using preposition 为了
- Recount events in simple past time using action verbs with 了 (temporal marker) and dependent time phrase/clause in complex sentence
- Order a series of events using sequencing adverbs
- Describe attributes of person/place/thing using modifying phrases
- Predict degree of probability of something using auxiliary "helping" verbs
- Construct characters to form words and phrases adhering to character structure rules and stroke order guidelines
- Use a developing understanding of basic units of word formation in Chinese to infer and construct meaning with written text
- Support ideas/opinions using compound sentences with adverb 因此
- State purpose/function of a thing or an action using purpose verb phrase 来 + verb + object
- State use/function of someone using nominalization and purpose verb phrase, 来 + verb + object
- State or identify what/who something looks like
- Recognize and interpret semantic radicals as separate characters or as part of another character

Content-compatible (CC)

- State or identify what/who something is or is not
- Express a personal opinion and request agreement
- Express agreement/disagreement
- Negotiate to reach consensus
- Make inferences based on visual clues
- Ask for clarification about feedback/advice/idea
- Negotiate turn-taking
- Give an example

Vocabulary

	了解 Recognize	识记 Produce
Content-obligatory	**Professional People** 建筑师 architect, 木匠 carpenter **Engineering Design Process** 工程设计步骤 Engineering Design Process, 提问 ask, 思考 imagine, 设计 plan, 制作 create, 改进 improve, 步骤 step, 设计 to design, 模型 to model/modeling, 去解决实际问题 to solve real-world problem, 真正的 real , 不是真正的 unreal **Water-Related Words** 葫芦 tecomate, 葫芦 hulu, 冲了个澡 to sprinkle, 大洪水 flood, 井 well, 打水 to fetch water (from well), 变臭 turn smelly (smelly water), 缺乏 scarcity, 节约/ 节省 save **Cross Cultural Chart** 白头鹰 bald eagle, 丹顶鹤 red-crowned crane, 海喜鹊 motmot bird, 礼物 gift, 送行 / 送别/ 赠别 send-off, 拥抱 hug, 折柳 bend the willow	**Professional People** 科学家 scientist, 工程师 engineer, 生物工程师 bioengineer **Scientific Method** 提问 ask questions, 假设 make hypothesis, 测试 test hypothesis, 分析 analyze results, 结论 draw conclusions, 汇报 report results, 实验 experiment, 观察 to observe, 测试 to test **Properties of Membranes** 特征 properties, 薄 thin, 厚 thick, 穿过/通过 pass through, 阻挡 block, 保护 protect, 有洞 has holes, 有小孔 has small holes, 阻挡灰尘 blocks dirt/keeps dirt out, 吸收 absorb **Cross Cultural Chart** 送礼 gift-giving, 告别 leave-taking

	了解 Recognize	识记 Produce
Content-compatible	**Punctuation Marks** 引号 quotation marks, 句号 period, 逗号 comma, 问号 question mark **Instructional Activities** 全班 whole class, 小组 small group, 伙伴 partner **Properties of Raisins** ***质地 texture:*** 鼓的 plump, 皱褶的 wrinkly, 糊状的 squishy, 细的 slimy **Rain Forest Features** 树冠层 leafy canopy, 国鸟 national bird, 瀑布 waterfall, 一片绿色的叶子 waxy green leaf, 一滴水 drop of water, 绿色的油光发亮的 waxy green leaf, 潮湿 moist, 海喜鹊 motmot bird	**Story Elements/Literacy Terms** 章节 chapter, 人物 characters, 和结局 solution, 主要人物 main character, 主体思想 main idea, 细节 details, 问题 problem, 比较 to compare/contrast, 推测 to predict/prediction, 场景 setting, 人物 characters, 事件 events **Properties of Raisins** ***形状 shape:*** 圆的 round ***质地 texture:*** 湿的 wet, 干的 dry, 平滑的 smooth, 粗糙的 rough, 硬的 hard ***颜色 color:*** 褐色的 brown, 浅褐色的 light brown, 深褐色的 dark brown, 紫色的 purple, 黑褐色的 black, ***大小 size:*** 大的 big , 小的 small, 中等的 average/medium **Rain Forest/Water Features** 热带雨林 rain forest, 华盖 canopy, 滴 drip, 瀑布 waterfall, 湿乎乎的 moist **Instructional Activities** 日志 journal, 照片 photo, for example, "共同点" "in common" **Job Cards/Roles** 中文督察员 Chinese Champion, 材料管理员 Magnificent Materials Manager, 记录员 Remarkable Recorder, 工作管理员 Terrific Taskmaster, 演示质检员 Polished Presenter

Note: In the ***Language Function-Form-Vocabulary Connection*** section you will find additional vocabulary that is directly supportive of the various language functions. The particular words and phrases you choose to target for this lesson will depend on your students' proficiency levels. Because of this, we have not included all vocabulary here. Also, at the end of this lesson you will find a table that provides more detailed information about the lesson vocabulary identified above.

PREPARATION (教学准备)

Materials Needed for Instruction

- MMIC *Juan Daniel* CH: Mandarin Chinese version of the *Juan Daniel* story
- Interactive whiteboard pages for Lesson 10: MMIC 10-IWB

Note: *Before beginning this lesson, be sure to copy and paste completed page 21 of MMIC 8-IWB, (Title: Chapter 6 Predictions), as page 7 of MMIC 10-IWB.*

Note: *Be sure to prepare IWB page 1 (Title: Raisin Skin: A Natural Membrane?) before Activity 1. Insert photos of students in action at each step of the Scientific Method during the raisin experiment (Lesson 9) as follows:*

- Step 1: Make hypothesis (Photo: Students examining raisins to describe them)
- Step 2: Test hypothesis (Photo: Students completing MMIC 9-3 (EiE® {3-1}): *Exploring Membranes: Raisin Skin*)
- Step 3: Analyze results (Photo: Students co-constructing and sharing compare and contrast sentences)
- Step 4: Draw conclusions (Photo: "What Have We Learned About Membranes" chart)
- Step 5: Report conclusions (Photo: Students recording conclusions in science journals)

- 5 pieces of 11 x 17" paper, one for each step of the Scientific Method
- Flipchart paper for the scientist/engineer compare-contrast chart
- Students' science notebooks
- Objects to illustrate the words "sponge", "fabric", and "plastic bag" from *Juan Daniel*, Chapter 6 (*Teacher supplies these*)
- Cross-cultural wall chart
- Handouts:
    a. MMIC 10-1-TG: *The Scientific Method*, Teacher Guide
    b. MMIC 10-1: The Five Steps of the Scientific Method, cut into strips and put into brown bag, one strip per group
    c. MMIC 10-2: *Chapter 5 Summary Paragraph*, one copy per group
    d. MMIC 10-3 (EiE® {4-1}): *The Engineering Design Process*
    e. MMIC 10-4: *Chapter 6 Paragraph on the Engineering Design Process*, one copy per pair
    f. MMIC 10-5: *Juan Daniel and the Engineering Design Process*, one copy per pair

LEARNING ACTIVITIES (教学活动)

Preview Phase—"Into" Activities

Students will review steps of the Scientific Method using the raisin experiment. They will also review the definition of a membrane and develop a definition of "model." They will review rain forest vocabulary, main events of *Juan Daniel*, Chapter 5 and the Chapter 6 predictions that they formulated in Lesson 8.

Time: Learning Activity 1—30 minutes
Learning Activity 2—50 minutes
Learning Activity 3—20 minutes
Learning Activity 4—30 minutes

Note: *Be sure to prepare page 1 of MMIC 10-IWB: "Raisin Skin: A Natural Membrane?" before Activity 1. This page will show a series of photos taken of the class during the raisin experiment (Lesson 9) that textually or visually represent the five steps of the Scientific Method. Consult "Preparation" section of this lesson plan for instructions on which photos to place at each step.*

Learning Activity 1

1. Invite the class to open their *Juan Daniel* packets and look at the title of Chapter 6: "设计薄膜模型 (Modeling a Membrane)." Ask students to point out any words or parts of characters in the title that they recognize.
2. Once students note the word "薄膜 (membrane)" as recognizable, ask students to work with a partner to construct a complete sentence about membranes. When ready, student pairs should share sentences with another student pair. Invite a couple of pairs to share their sentences with the whole class and then ask students to put their story packets away.
3. Next, ask students:

中文	English
为了学习薄膜，他们都做了些什么？ (用葡萄干来做实验)	What did they do to learn about membranes? (An experiment with raisins.)
什么样的专业人士通过做实验来研究世界? (科学家)	What kinds of professionals do experiments to learn about the world? (Scientists.)
谁还记得我们为什么做葡萄干的实验? (为了验证这样一个想法：“就像青蛙的皮肤一样，葡萄干的表皮也是一种薄膜：它能让某些东西经过，也能阻挡另一些东西。”)	Who recalls why the class wanted to do an experiment with raisins? (To test the idea that "raisin skin, like frog skin, is a membrane: it allows some things to pass through and blocks other things.")

有没有谁能想出另一种可以表示"没有经过验证的想法?" (假设。)	Can anyone think of other words that mean "an untested idea?" (Hypothesis.)

4. Write 假设 (hypothesis) on the whiteboard and ask students to give a few examples of hypotheses they have about the world we live in.
5. Display page 2 of MMIC 10-IWB titled "Raisin Skin: A Natural Membrane?" title only. Tell students that the class will begin working together to illustrate the steps of the Scientific Method by recalling what happened during the raisin experiment.
6. Divide students into five groups. Allow one member of each group to choose a piece of paper from a bag. Each piece of paper will show the number and name of one of the five steps of the Scientific Method. The chosen paper is the group's assigned step for the following activity.
7. Present task to students: In groups they will work together to recall, illustrate, and present their step of the Scientific Method to the class (in order) and what took place during the raisin experiment that corresponds to this step.
8. Depending on numbers of students in each group, assign jobs accordingly and display task directions and job descriptions on page 3 of MMIC 10-IWB:
    - **材料管理员 (Magnificent Materials Manager):** Picks up piece of paper and any illustration materials
    - **演示质检员 (Polished Presenter):** Presents group's step aloud for the class
    - **记录员 (Remarkable Recorder):** Writes out group's step
    - **中文督察员 (Chinese Champion):** Uses resources to help with vocabulary and helps the group to stay in Chinese during the activity
    - **工作管理员 (Terrific Taskmaster):** Directs shared illustrating and manages task time
9. Allow students time to work and present their step and corresponding illustrations.
10. Once again, display the title and table on page 4 of MMIC 10-IWB, "Raisin Skin: A Natural Membrane?" This page includes a table with photos of students engaged in the various steps of the Scientific Method as they tested their hypotheses about raisin skin.
11. Ask students to draw a similar "Raisin Skin: A Natural Membrane?" table with two columns in their science notebooks: "Scientific Method" and "Raisin Experiment" (MINUS the "photos" column). Be sure to let them know the chart should be big enough to include a lot of writing!

Note: It is important that students take complete notes since these notes will be crucial as the unit continues.

12. One at a time, display each photo showing students engaged in the raisin experiment. First, invite students to identify the corresponding step of the Scientific Method based on the photo. Then, orally co-construct what happened during that step with the class and write it in the appropriate space of the "Raisin Experiment" column. Ask students to follow along and take complete notes about each step of the Scientific Method in their journals.

Use the following question guide to carry out this whole class activity:

中文	English
Step 1: Make hypothesis	
这是图片里的第几步？对于葡萄干的表皮，你想验证哪些假设?	Which step do we see in this photo? What hypothesis did you want to test about raisin skin?
Step 2: Test hypothesis	
这是图片里的第几步？你想做什么来测试你的假设?	Which step do we see in this photo? What did you do to test your hypothesis?
Step 3: Analyze results	
这是图片里的第几步？你想做什么来得到你的结果?	Which step do we see in this photo? What did you do to get your results?
Step 4: Draw conclusions	
这是图片里的第几步？让我们再温习一下我们的假设，我们的结论是什么?	Which step do we see in this photo? Let's review our hypotheses. What were our conclusions about the hypotheses?
Step 5: Report conclusions	
这是图片里的第几步？我们怎样公布葡萄干实验的结论?	Which step do we see in this photo? How did you report your conclusion from the raisin experiment?

Note: *A sample table with possible responses to each of the above questions is provided in the teacher guide, MMIC 10-1-TG.*

Language Function-Form-Vocabulary Connections (Activity 1)	
CO LP 10.1.1	**Identify and construct semantic radicals as separate characters or as part of another character**

For example:
言 (yán, speech), when used as a semantic radical, turns into 讠, e.g., 说 (to speak)
牛 (niú, ox), when used as a semantic radical, has two forms: 牜, e.g., 物 (object) or □, e.g., 告 (to tell)

Note: *At the end of this lesson you will find a table that provides 50 most frequently used radicals.*

Approaching	**Attaining**	**Expanding**
Some semantic radicals can be stand-alone characters and do not change form when used as part of another character: 大 (big), 天 (sky/heaven/day) 虫(insect), 蛙 (frog) Some semantic radicals can only be part of other characters: 疒 (sick), 病 (illness, sick) 艹 (grass), 草 (grass)	Some semantic radicals change form when used as part of another character: 手 (hand) could be in the forms of 扌→ 把 ("bǎ") or 手→看 (look) 金 (gold) will be in the form of 钅→锻炼 (exercise)	Some less commonly used semantic radicals: 矢 (shǐ, arrow) as in 矮 (short) 身 (shēn, body) as in 躺 (to lie down)

Form focus

1. Semantic radicals

There are about 201 semantic radicals used in 7,000 characters listed in the *Statistics of Commonly Used Characters* 《现代汉语通用字表》 (1998). Among 201 radicals, 100 are frequently used in high frequency characters (Shen, 2007). Historically, semantic radicals are all integral characters. Take the above mentioned character 蛙 as an example: the left part of the character 虫 (insect) is a semantic radical and it suggests the meaning of this character "tadpole." However, 虫 by itself is also an independent character. A few semantic radicals, however, no longer appear as independent characters in modern Chinese.

Semantic radicals can cue the meaning of the compound characters. For example, more than 90% of compound characters with the semantic radical 手 (hand) have their meanings related to the hand or to the action of the hand (Jin, 1985). However, the semantic radical suggests only a general category of meaning of the compound; it does not provide a specific meaning or definition. Take the character 河 (river) for example: the semantic radical in this character is 氵 (water), which suggests that its meaning has some relationship only to water; it does not provide the exact meaning *river*.

2. Placement of semantic radicals
There are rules of thumb for where to place radicals: 1. Left part of the character 2. Right part of the character 3. Top part of the character 4. Bottom part of the character 5. Whole-word frames: 口 (surround), totally enclosed, and 疒 (sickness) or 辶 (to go, movement), examples of partially enclosed

CO LP 10.1.2	**Give emphasis to the specific direct object by using 把 or 让/使 construction and placing the direct object before the verb**	
Approaching	**Attaining**	**Expanding**
薄膜阻挡有害的东西在外面，例如灰尘。 Membranes block/stop harmful things outside, for example, dirt.	薄膜把有害的东西挡在外面，例如灰尘。 Membranes protect by keeping harmful things out, for example, dirt.	薄膜让别的东西经过，像空气或者水。 Membranes let some things pass through, such as air and water.
Subj. + Verb + Object + Complement (adv.), for example, …	Subj. + 把-construction [把 + object + verb + adv. phrase [得 (adv. marker) + adv.]], for example, …	Subj. + 让/使-construction [让/使 + direct object + verb], such as, …
Form focus		
1. Use of 把-construction vs. simple SVO (Subj-verb-direct object)		
A 把-construction (including 把 + direct object + verb + complement) will typically reference something specific that the speaker thinks the hearer knows about, not something unknown to the hearer. If a sentence *communicates something that happens to the direct object*, then use of the 把-construction is appropriate. For example, • Juan Daniel **把**球踢进了。 (Subj +把 + direct object noun phrase + verb + directional complement + past tense marker.) Juan Daniel kicked the soccer ball in. • 我们**把**这个想法放/写在这个部分。 (Subj +把 + direct object noun phrase + verb + locative complement.) We wrote/put our ideas in this section. However, if there is *no additional information given as to what has happened to the direct object*, use of a 把-construction is incorrect. For example, in the sentence below, the 把-construction is not allowed:		

Juan Daniel 想他的青蛙。(Subj. + verb + direct object noun phrase) Juan Daniel misses his frog.

CO LP 10.1.3	**Construct characters to form words and phrases adhering to character structure rules and stroke order guidelines**

For example:
Left-right: 叫、场
Top-bottom: 吉、只
Left, middle, right: 树、谁
Top, middle, bottom: 复、常
One-part, totally enclosed: 国、回
Partially enclosed: 用，原

Approaching	**Attaining**	**Expanding**
One- and two-part characters One-part character 我、生 One-part, totally enclosed 国、回 Two-part characters Left-right: 叫、场 Top-bottom: 吉、只	**Three-part characters** Left, middle, right: 树、谁 Top, middle, bottom: 复、常 Left, top-right, bottom-right: 锋、纷 Top-left, bottom-left, right: 部、剂、劲 Left-top, right-top, bottom: 然、赞 Top, left-bottom, right-top: 死、前	**Four + part characters** Left-top, right-top, left-bottom, right bottom: 能、舒 Left, top-right, middle-right, bottom-right: 慢、镜 Left, middle, top-right, bottom-right: 游 Left, middle-top, middle-bottom, right: 湖

Form focus: Formation of Chinese characters

1. Character structure rules

Chinese characters are called "square" characters because no matter how simple or complex, each character fits inside a square. Characters can usually be divided into different parts. These parts form character structures. There are four main structures: one-part structure, two-part structure, three-part structure, and four-part structure. These structures can be further divided into sub-parts.

For example,
Two-part structures:  (top/bottom),  (left/right)
Three-part structures:  (left, top-right, bottom-right),  (top-left, bottom-left, right), etc.

2. Stroke order guidelines
General rules for writing Chinese characters are: 1. Horizontal first, then vertical. 2. Top first, then bottom. 3. Left first, then right. 4. Left-slanted first, then right-slanted. 5. Outside first, then inside. 6. Center first, then both sides. 7. With "closed" characters, enter character first, then close it up.

CO LP 10.1.4	**Ask and answer questions using question words**	
For example:		
Approaching	**Attaining**	**Expanding**
…… 吗? Use of ma …… 是不是……? Is or is not?	谁……? (Who) 什么……? (What) 哪里……? (Where) 什么时候……? (When) 怎么……? (How) 为什么……? (Why)	几/多少? (How many) 哪(些)……? (Which)
Form focus: Placement of question words		
Most question words in English occur at the beginning of a sentence. However, question words in Chinese occur in a variety of positions. Generally, question words appear in the same position as the grammatical function they serve in the sentence. For example: 谁参加足球比赛? (Who is going to play the soccer game? ["Who" occurs in subject position]) 你看见几个足球运动员? (How many soccer players did you see? ["How many" is in the # position of the noun phrase #		
Noticing and awareness spotlight: Use of 吗? 吧? 呢?		
A few particles are commonly used at the end of questions. 吧? is used to invite agreement. 呢? is a tag question meaning ", and you?" 吗? is a question particle that is used when one expects a "yes" or "no" response.		

Adaptation of EiE® story *Juan Daniel's Fútbol Frog*, Chapter 6

CO LP 10.1.5	**Give reasons for actions/choices/preferences using preposition 为了**	
Approaching	**Attaining**	**Expanding**
我们做了葡萄干实验，**因为**我们想验证我们的想法。 We did the raisin experiment, because we want to prove our ideas。	**为了**验证这样一个想法，我们做了一个葡萄干实验。 In order to prove such an idea, we did an experiment with raisins.	我们选择了做葡萄干实验的原因是…… The reason that we chose to carry out an experiment was….
....., 因为 (because)……	Preposition/coverb (**为了**/for the purpose of) + verb + object, result clause [subj + verb + object].	Modifying adjective phrase [Subj. pronoun + $Verb_1$ + $Verb_2$ + object + 的] + Noun/Subject (原因)+ main verb (是) ……
Form focus: Use of preposition 为了		
When a compound sentence begins with the preposition/coverb 为了 (for the purpose of), it needs to be followed by a main clause that states the result of the action stated in the initial 为了-clause.		
Noticing and awareness spotlight: Placement of preposition/coverb		
Prepositions/coverbs such as **为了** (for the purpose of) introduce a noun phrase. Together, the preposition + noun phrase combination are typically placed before the main SVO in the sentence. In sentence initial position they add emphasis.		

CO LP 10.1.6	**Recount events in simple past time using action verbs with 了 (temporal marker) and dependent time phrase/clause in complex sentence**	
For example:		
Approaching	**Attaining**	**Expanding**
我们做了一个葡萄干实验。我们学习了薄膜。 We do the raisin experiment. We learn about membranes.	**在**做葡萄干实验**的时候**，我们学习了薄膜的特性。 During the raisin experiment, we learned about the properties of a membrane.	葡萄干停留在水中过夜**后**，它变得鼓鼓的。 When the raisin stayed in water overnight, it became plump.
Simple past time using action verb with temporal marker 了	Use of dependent time phrase in complex sentence and temporal marker 了	Use of dependent time clause with time preposition in complex sentence

Form focus
1. Use of 了 as temporal marker
Simple past time can be communicated using 了 (temporal marker), e.g., action verb + 了 (temporal marker). The temporal marker "了" is positioned either immediately after the main verb or at the end of the sentence/clause.
2. Use of dependent time phrase/clause in complex sentence
Mandarin uses adverbs of time and adverb of time phrases to connect two clauses and form one complex sentence. The first clause may consist of • An adverb of time placed at the end of the first clause [noun + adverb of time **的时候**], e.g., 足球比赛**的时候**, …… (While at the soccer game, …) • or an adverb of time phrase that is separated into two parts [**当** (part 1) **+** simple SVO sentence + 的时候 (part 2)], e.g., **当** 我们测试尼龙纱窗布**的时候**，……. (When we tested the nylon screen,…). For example, Noun/simple SVO sentence + adverb of time phrase 以后……后 (after)，+ main clause. Noun/simple SVO sentence + adverb of time 以前 (before)，+ main clause. Noun/simple SVO sentence + adverb of time phrase **当……**的时候 (when/while at)，+ main clause.
Noticing and awareness spotlight
1. Use of temporal marker "了" with "verb + verb complement" structure
When a two-character "verb + verb complement" structure is used, the temporal marker "了" must be placed after the verb complement. For example, ［我］看到**了**。(I saw.) However, if the verb complement consists of two characters instead of just one, then "了" can be placed either after the one-character first main verb or after the two-character verb complement. For example, 他走**了**出来。(He walked out of there.) 他走出来**了**。(He walked out of there.)
2. Use of particles 的、地、得
的 (de) is used when an adjective and/or a pronoun modifies a noun. The form is: Adj./pron. + 的 + Noun, for example, 炎热的夏天 (sweltering summer), 我们的薄膜模型 (our model membrane design) 地 (de) is used when an adverb modifies a verb. The form is: Adv. + 地 + Verb (unlike in English!), for example, 高兴地欢呼 (cheer happily)

得 (de), as a potential complement, is used as a complement to further describe a main verb/adjective. It is placed after the verb/adjective it describes. The form is:
Verb/adjective + 得 + degree complement

The degree complement can be made up of an adverb or a noun phrase.
For example,
我跑得快。(I ran fast.) (得 + adverb as degree complement)
薄膜有一些小得眼睛都看不见的孔。 (Membranes have holes that are too small to see.) (得 + noun phrase as degree complement).

CO LP 10.1.7	**Order a series of events using sequencing adverbs**	
Approaching	**Attaining**	**Expanding**
第一、第二、第三…… Ordinals: first, second, third… 首先，……，然后，……，最后，…… First, …, later, …, finally, … 开始 in the beginning ……先……，……后…… …before…, …after…	首先，……，再，……，接下来，…… Initially, …, then, …, next, … 起先、起初， in the beginning 后来 later on 那以后 after that 结束 at the end	于是， consequently, as a result 总之 in conclusion 稍后 afterwards 最终 at the end
Form focus: Placement of sequencing adverbs		
Sequencing adverbs are usually placed at the beginning of the sentence and set off with a comma.		

CC LP 10.1.8	**Give an example**	
Approaching	**Attaining**	**Expanding**
薄膜阻挡有害的东西在外面，例如灰尘。 Membranes block/stop harmful things outside, for example, dirt.	薄膜把有害的东西挡在外面，**例如/像**灰尘。 Membranes protect by keeping harmful things out, for example, dirt.	薄膜让别的东西经过，**举个例子**空气和水。 Membranes let some things pass through, such as air and water.
Subj. + Verb + Object + Complement (adv.), for example, …	Subj. + 把-construction [把 + object + verb + adv. phrase [得 (adv. marker) + adv.]], for example, …	Subj. + 让/使-construction [让/使 + direct object + verb], such as, …
Noticing and awareness spotlight		
There are different phrases used to give an example. These phrases are usually set off with a comma. 例如/譬如 (for example, for instance) 像 (like, such as) 举个例子来说 (to illustrate this) 换句话说 (in other words, to put it another way) 就是说 (that is to say) 好像 …… 似的 (just as/like… [used as simile])		

Learning Activity 2

Note: *Before beginning this learning activity, be sure to copy and paste completed page 21 of MMIC 8-IWB, (Title: Chapter 6 Predictions), as page 7 of MMIC 10-IWB.*

1. Ask students to return to their most recent working groups and discuss Chapter 5 with group members:

中文	English
在 Juan Daniel 第五章，你记住了什么？	What do you remember from *Juan Daniel,* Chapter 5?

2. To review the features of the rain forest that Juan Daniel saw during his visit there, show a series of pictures on page 5 of MMIC 10-IWB: 树冠层 (leafy canopy), 国鸟 (national bird), 瀑布 (waterfall), 蜡质叶面 (a waxy green leaf), 水滴 (drops of water). For each of the pictures, ask/say:

中文	English
热带雨林的特点是什么？请描述你所看到的。	What is this feature of the rain forest? Describe what you see.

   Be sure to write characters for words/phrases describing the pictures on the whiteboard as students say them.

Note: *When presenting the* 海喜鹊 (*motmot bird), ask students if they remember what is important about this bird (It is the national bird of El Salvador). Do they remember what the national birds are for the US and China? (Bald Eagle and Red-crowned Crane) Technically, China does not have an official national bird, but the Red-crowned Crane has been proposed.*

3. Display page 6 of MMIC 10-IWB, the picture from the last page of *Juan Daniel,* Chapter 5 (the picture of Juan Daniel catching the drop of water from the leaf in the rain forest). Ask groups to work together in pairs to complete MMIC 10-2, *Chapter 5 Summary Paragraph.*
4. Allow students time to work together and share their answers with the class.
5. Collect the summaries for evidence of story comprehension, vocabulary and character skills development.
6. Ask the class to turn to the last page of *Juan Daniel,* Chapter 5. Read the last sentence from that chapter aloud:

中文	English
"原来如此！" Juan Daniel 恍然大悟，"我要做的东西得像叶子上的水滴一样缓缓地滴下来。这样才能保持青蛙皮肤	That's it! I need to make something that will drip just enough water onto the frog to keep him moist. Now I need to figure out how to design it!

的湿润。现在我要想一想怎么设计它！”	

7. Ask students to whisper to a partner the name for professionals who create or design things to solve everyday, real-world problems. (工程师 [Engineers]!)
8. Display page 7 of MMIC 10-IWB and review predictions that the class made at the end of Lesson 8 about what they thought would happen in *Juan Daniel,* Chapter 6. Ask the class if anyone would like to make any changes to earlier predictions. Write any changes on the whiteboard page.

Language Function-Form-Vocabulary Connections (Activity 2)		
CO LP 10.2.1	**Recount events in simple past time using action verbs with 了 (temporal marker) and dependent time phrase/clause in complex sentence**	
For example:		
Approaching	**Attaining**	**Expanding**
Juan Daniel 去了热带雨林，他看见了瀑布。 Juan Daniel went to the rain forest and saw a waterfall.	当 Juan Daniel 在热带雨林的时候，他想起他的小青蛙坐在瀑布下。 While in the rain forest Juan Daniel thought about his little frog sitting under the waterfall.	正当 Juan Daniel 看见了很多水滴慢慢地从叶子上流下来的时候，他伸出手去接这些水滴。 When Juan Daniel saw the shiny bead of water, he held out his hand and caught a drip of water.
Simple past time using action verb with temporal marker 了	Use of dependent time phrase in complex sentence and temporal marker 了	Use of dependent time clause in complex sentence and temporal marker 了
Form focus		
1. Use of 了 as temporal marker		
Simple past time can be communicated using 了 (temporal marker), e.g., action verb + 了 (temporal marker). The temporal marker "了" is positioned either immediately after the main verb or at the end of the sentence/clause.		
2. Use of dependent time phrase/clause in complex sentence		
Mandarin uses prepositions as linking words to connect two clauses and form one complex sentence. When the first clause is dependent on the second clause to complete its meaning, prepositions will be placed at the end of the first clause. The first clause may consist of a time phrase [noun + preposition] (e.g., **在**足球比赛**的时候**, …… During the soccer game) or a time clause with an adverb of time such as 正当 …..的时候 (just when). For example, 正当他鼓足劲儿要出脚的时候, …… At the moment when he was about to kick the ball,… For example, Noun/simple SVO sentence + (以)后 (after)，+ main clause. Noun/simple SVO sentence + (以)前 (before)，+ main clause. Noun/simple SVO sentence + (正当) …..的时候 (when/while at)，+ main clause.		
Noticing and awareness spotlight: Use of temporal marker "了" with "verb + verb complement" structure		
When a two-character "verb + verb complement" structure is used, the temporal marker "了" must be placed after the verb complement.		

For example,
［我］看到**了**。(I saw.)

However, if the verb complement consists of two characters instead of just one, then "了" can be placed either after the one-character first main verb or after the two-character verb complement.
For example,
他走**了**出来。(He walked out of there.)
他走出来**了**。(He walked out of there.)

CO LP 10.2.2	**Describe attributes of person/place/thing using modifying phrases**

For example:
有一个橘红色的脖子的海喜鹊(the motmot that has an orange throat)
一片光亮的、绿色的叶子(the waxy leaf that is shiny and green)

Approaching	**Attaining**	**Expanding**
热的 (hot) 多雨的(rainy) 绿色的(green) 湿的(wet) 好 (good/nice) 坏 (bad/mean) 光亮的 (shiny) 厚厚的 (thick) 薄的 (thin)	有一个橘红色的脖子的 (that has an orange throat) (没)有帮助的 (that is helpful/not helpful)	让水通过的 (that allows water to pass through) 阻挡某些东西通过的 (that blocks some things from passing through) 阻挡阳光的 (that blocks sunlight)
Attributive adjective [adj. + 的] + Head noun	Relative clause [(没)有 + noun + 的] + Head noun	Relative clause [verb + noun + 的] + Head noun

Form focus: Relative clause [verb + noun + 的] + Head noun

Modifying phrases can be either attributive adjectives, e.g., 薄的 (thin)
or relative clauses, e.g., 有 (have) 小孔 (tiny holes) + 的 (that has tiny holes). Modifying phrases are placed in front of the head noun (e.g., 提供栖息地的热带雨林).

Noticing and awareness spotlight

1. The negation of 有 (have) is 没有

The negative particle 没 (méi), not 不 (bù), must be used to negate 有 (yǒu) [have].
没 can be used by itself to express 没有 (méi yǒu). If 没 is used by itself, 有 is assumed such that 没 = 没有.

2. Adjective repetition
Adjective repetition occurs frequently in Chinese. There are different ways to do this: 1. "aa" form, e.g., 长长 (very long), 厚厚 (thick)、薄薄 (thin)*; 2. "abb" form, e.g., 白皑皑 (snow-white, pure white, as very white as snow), 毛绒绒 or 毛茸茸 (hairy or downy), 亮晶晶 (glistening, sparkling, shining), 湿漉漉 (wet, moist); 3. "aabb" form, e.g., 清清楚楚 (clear), 恍恍惚惚 (in a trance, absent-minded), 红红火火 (as very red/warm as fire). • Use of double adjectives is typical for young children.
3. The "monosyllabic" rule and use of 的
When describing persons, places and things, the use of 的 between adj. and noun will occur if the adjective is made up of more than one syllable, for example, 两只有蹼的脚 (two webbed feet). However, use of 的 between the adjective and noun is omitted if the adjective is only one syllable. For example, 两只大眼睛 (two big eyes).

CO LP 10.2.3	**Use a developing understanding of basic units of word formation in Chinese to infer and construct meaning with written text**
Form focus: radical → character → compound/word	
1. radical	
A radical is the smallest meaningful orthographic unit in compound characters, for example, 虫 (insect) is used in the character 蛙 (frog). 虫 (insect) can also be a stand-alone character. There are three types of radicals: semantic (give information about character meaning) [手 (hand)], phonetic (give information about character pronunciation) [分 (fen) in the compound 纷 (one after another)], and perceptual (do not give information about character meaning or pronunciation, instead function as visual fillers) [此 (this, these in classical Chinese), however, in the compound 嘴 (mouth) the radical 此 functions as a perceptual radical providing information about neither meaning nor pronunciation].	
2. character	
A Chinese character is a meaningful orthographic unit that is always pronounced as one syllable. Chinese characters have evolved as a writing system over millennia and have developed in various ways. Some characters are **pictographs** that were originally drawings of concrete objects, for example, 雨 (rain), the four dots depicting the rain coming down from the sky; others are better described as **ideographs** because they were created as graphic representations of more abstract ideas such as the notion of "above", 上, the stroke above the horizontal line indicating the idea of "above" or "up." Another way to create characters was to combine two or more pictographs or ideographs to portray a new meaning, for example, 休 (to rest), a combination of the pictographs for person, 人, and a person leaning against a tree, 木. These types of characters are referred to as **ideogrammatic characters**.	

Over 90% of Chinese characters were created as **phono-semantic compound characters** and are made up of a combination of semantic and phonetic radicals. For example，控 (to control), the semantic radical on the left side,手 (hand) , indicates that the word meaning will include an action with a hand, and the phonetic radical on the right side 空 (kōng), helps the reader with character pronunciation "kòng."
3. compound
Compounds consist of at least two characters, neither of which is an affix, a character that on its own lacks meaning but when added to other characters becomes a meaningful unit. Most Chinese words are compounds. Compounds have various types of syntactic relationships. A few compound types: *Verb-Object:* 踢足球 (to kick soccer ball)、开球 (to kick of)、发誓 (to pledge) *Verb-Complement*: 摔倒 (to fall down)、改进 (to improve and get better)、进来 (to come in) *Subject-Predicate*: 天亮 (bright [sky is bright]) *Number-Classifier*: 各种 (various kinds)、一道 (a ray of…)、一片 (a patch of…) *Adverb-Verb*: 慢跑 (to jog [to run slowly])、快走 (to hurry [to walk fast]) *Verb-Verb-Noun*: 栖息地 (habitat [to stay and rest at a place]) *Adjective-Adjective-Noun*: 浅桃色 (light peach color)、吉祥物 (mascot [happy and auspicious object])
4. word
A word is written with one or more Chinese characters. A word can consist of a single character (脚, foot), a compound (幸运, lucky), a duplicate (招招手, to wave), or an affixed form (第一, first， 第二, second, etc.).

CO LP 10.2.4	**Predict degree of probability of something using auxiliary "helping" verbs**	
For example:		
Approaching	**Attaining**	**Expanding**
我想 Juan Daniel **可能**设计一个薄膜模型。 I think Juan Daniel is likely to design a model membrane.	我觉得／想 Juan Daniel 会设计一个薄膜模型。 I feel like/think Juan Daniel will design a model membrane.	在我看来，Juan Daniel 接下来**要**设计一个薄膜模型。 It seems to me that Juan Daniel will design a model membrane next.
Use of adverb "可能" to express future possibility.	Use of auxiliary 会 + main verb 设计	Use of adverb of time 接下来 (next) + auxiliary 要 + main verb 设计

Form focus
1. Auxiliary "helping verbs"
In Mandarin, auxiliary "helping verbs" indicate the ability, possibility, intention or desire to carry out an action. The following are examples of auxiliary "helping verbs": 会 'will likely + verb', 会 'will know + verb', 能/可以'able to + verb', 要/应该'ought to + verb', 要/想'want to + verb', 可以'allow to + verb', 不可以'prohibited to + verb'.
2. How auxiliary "helping verbs" are same/different from other verbs
Like other verbs, auxiliary verbs… a. occur as the A element in A-not-A questions, for example, 薄膜的孔应该不应该很小? (Should the holes of a membrane be small?); b. can be negated, or example: 薄膜的孔不应该很大。(The holes of a membrane should not be big.) Unlike other verbs, auxiliary verbs … a. must co-occur with a verb or an assumed verb; For example, 薄膜的孔应该不应该很小? (Should the holes of a membrane be small?) b. does not take aspect markers such as 了(le), 过(guò), 着 zhe; c. cannot be modified by intensifiers, such as 很 (very) or 更 (even more); d. cannot be nominalized; e. cannot occur before the subject; f. cannot take a direct object.
Noticing and awareness spotlight
1. Three uses of character 会
a. 会 as a verb (to know). For example: 我**会**中文。(I know Chinese.) b. 会 as an auxiliary + verb (specifies a learned, acquired and usually mental ability: "know how to" or "to learn how"). For example: 我**会**踢足球 。(I know how to play soccer.) c. 会 as an auxiliary + verb (refers to the likelihood of the occurrence of an event: "will", "most likely"). For example: 冠军赛明年会在这里举行。(The championship game will be held here next year.)
2. The difference between 能 and 会
能 and 会 are both auxiliary verbs meaning "can" or "may." They are used interchangeably. However, there is a difference between them: 会 (huì) specifies a learned, acquired skill or a mental ability; 能 (néng) means having the physical ability or opportunity to do something unless a condition prevents it. It is always followed by an action verb (or an action verb is understood).

Adaptation of EiE® story *Juan Daniel's Fútbol Frog*, Chapter 6

For example: 我**会**设计薄膜模型，但是我现在不**能**，因为我没有合适的材料。 I can design a model membrane, but I cannot do it right now, because I don't have the right materials.

CC LP 10.2.5	**State or identify what/who something is or is not**	
For example:		
Approaching	**Attaining**	**Expanding**
这(不)是瀑布/热带雨林华盖。	这个东西(不) 是瀑布/热带雨林华盖/海喜鹊。	这个东西(不) 是一滴水。
This is/is not a waterfall/ rainforest's canopy.	This object is/is not a waterfall/canopy/motmot.	This object is/is not a drop of water.
Pronoun (这) + Verb (是) + noun.	Pronoun (这) + (CL + subj) + Verb (是) + noun.	Pronoun (这) + (CL + subj.) + Verb (是) + noun phrase (# + CL + noun).
Form focus		
不 (bú) is an adverb that means "not." Like most adverbs, 不 (bú) always appears before the verb, in this case, 是. 这 is a pronoun and means "this, these." It may or may not be followed by a classifier (CL) and a noun, for example, 这个人是工程师. (This person is an engineer.) 这是工程师. (This is an engineer.)		
Noticing and awareness spotlight: 个人/ 东西 vs. 位女士／男士		
The classifier 个 is the most commonly used classifier when referring to people or things. To indicate more respect for the person being referred to, use 位女士／男士, a more formal classifier + noun for people.		

CC LP 10.2.6	**Make inferences based on visual clues**	
For example:		
Approaching	**Attaining**	**Expanding**
我猜/想 I guess /think 也许/可能…… Maybe/ Perhaps… 在我看来…… It seems to me that …/In my opinion, …	我敢肯定…… I bet that… 图中的……告诉我们…… The ... in the picture tells us that…	我估计／推断／猜测…… I expect/deduce/suppose that … 似乎…… It seems as if… 从第七章中可以看到……／如第七章所示…… As is seen from chapter 7…

CC LP 10.2.7	**Express a personal opinion and request agreement**	
For example:		
Approaching	**Attaining**	**Expanding**
我觉得／想 ……, 你呢? I feel like/think……， and you? 也许／可能, 你呢? Maybe/perhaps…., and you?	在我看来……, 你也同意吗? It seems to me like…, do you agree? 对我来说, ……,你也同意吗? In my opinion, ….., do you agree? 我认为……,你也同意吗? I believe/think …, do you agree?	我建议……,你也是这么想的吗？/吧? I suggest…, do you think so? 我的看法是……,你也是这么想的吗？/吧? My thoughts are……, do you think so? 我是说……,你也是这么想的吗？/吧? What I mean is……, do you think so?
Noticing and awareness spotlight: Use of 吗？吧？ 呢？		
A few particles are commonly used at the end of questions. 吧？ is used to invite agreement. 呢？ is a tag question meaning ", and you?" 吗？ is a question particle that is used when one expects a "yes" or "no" response.		

Adaptation of EiE® story *Juan Daniel's Fútbol Frog*, Chapter 6

CC LP 10.2.8	**Negotiate to reach consensus**	
For example:		
Approaching	**Attaining**	**Expanding**
好吧。 OK. 我同意。 I agree.	我同意你的想法。 I agree with your idea. 我也一样。 Same here.	不约而同。 We reach the consensus without consulting with each other.

Learning Activity 3

1. Display page 8 of MMIC 10-IWB: Make a compare-contrast chart on chart paper to engage students in a compare and contrast exercise about scientists and engineers. Leave the first column blank and label columns two and three on the chart with the words "Scientists" and "Engineers." Ask students to draw a similar 3-column compare-contrast chart in their science notebooks.

	科学家	工程师
	Scientists	**Engineers**

2. Begin by engaging students in a think-pair-share activity with this introductory question:

中文	English
当你做葡萄干实验的时候，你觉得你像科学家还是工程师？ 为什么？	When you did the raisin experiment, were you behaving like scientists or engineers? What makes you think so?

3. Row by row, write the following questions in the first column and invite students to suggest answers to each question that you ask, beginning with the "Scientists" column (see sample compare-contrast chart for "scientists" below):
    a. Who?
    b. What do they do?
    c. Why?
    d. What method do they use in their work?
    e. What steps does their method/process involve?
4. As students answer, fill in the "Scientists" column and have students copy this information into their own charts.

Note: *Leave the "Engineers" column on the compare-contrast chart blank for now, as students will compare engineers and scientists later in this lesson.*

Compare-Contrast Chart: Scientists and Engineers

谁？	科学家	工程师
Who?	**Scientists**	**Engineers**
他们做什么？	通过实验来验证假设	
What do they do?	Carry out experiments to test hypotheses	
为什么？	了解我们生活的世界	
Why?	To learn about the world we live in	
他们用什么方法工作？	科学方法	
What method do they use in their work?	The scientific method	
他们的方法有什么步骤?	第一步：提出假设 第二步：验证假设 第三步：分析结果 第四步：得出结论 第五步：汇报结论	
What are the steps for this method/process?	Step 1: Make hypothesis Step 2: Test hypothesis Step 3: Analyze results Step 4: Draw conclusion Step 5: Report conclusion	

Language Function-Form-Vocabulary Connections (Activity 3)		
CO LP 10.3.1	**Ask and answer questions using question words**	
For example:		
Approaching	**Attaining**	**Expanding**
…… 吗? Use of ma …… 是不是……? Is or is not?	谁……? (Who) 什么……? (What) 哪里……? (Where) 什么时候……? (When) 怎么……? (How) 为什么……? (Why)	几/多少? (How many) 哪(些)……? (Which)
Form focus: Placement of question words		
Most question words in English occur at the beginning of a sentence. However, question words in Chinese occur in a variety of positions. Generally, question words appear in the same position as the grammatical function they serve in the sentence. For example: 谁参加足球比赛? (Who is going to play the soccer game? ["Who" occurs in subject position]) 你看见几个足球运动员? (How many soccer players did you see? ["How many" is in the # position of the noun phrase # + classifier + noun])		
Noticing and awareness spotlight: Use of 吗? 吧? 呢?		
A few particles are commonly used at the end of questions. 吧? is used to invite agreement. 呢? is a tag question meaning ", and you?" 吗? is a question particle that is used when one expects a "yes" or "no" response.		

CO LP 10.3.2	**Construct characters to form words and phrases adhering to character structure rules and stroke order guidelines**
For example: Left-right: 叫、场 Top-bottom: 吉、只 Left, middle, right: 树、谁 Top, middle, bottom: 复、常 One-part, totally enclosed: 国、回 Partially enclosed: 用，原	

Approaching	Attaining	Expanding
One- and two-part characters One-part character 我、生 One-part, totally enclosed 国、回 Two-part characters Left-right: 叫、场 Top-bottom: 吉、只	**Three-part characters** Left, middle, right: 树、谁 Top, middle, bottom: 复、常 Left, top-right, bottom-right: 锋、纷 Top-left, bottom-left, right: 部、剂、劲 Left-top, right-top, bottom: 然、赞 Top, left-bottom, right-top: 死、前	**Four + part characters** Left-top, right-top, left-bottom, right bottom: 能、舒 Left, top-right, middle-right, bottom-right: 慢、镜 Left, middle, top-right, bottom-right: 游 Left, middle-top, middle-bottom, right: 湖

Form focus: Formation of Chinese characters

1. Character structure rules

Chinese characters are called "square" characters because no matter how simple or complex, each character fits inside a square. Characters can usually be divided into different parts. These parts form character structures. There are four main structures: one-part structure, two-part structure, three-part structure, and four-part structure. These structures can be further divided into sub-parts.

For example,

Two-part structures:  (top/bottom),  (left/right)

Three-part structures:  (left, top-right, bottom-right),  (top-left, bottom-left, right), etc.

2. Stroke order guidelines

General rules for writing Chinese characters are:

1. Horizontal first, then vertical.
2. Top first, then bottom.
3. Left first, then right.
4. Left-slanted first, then right-slanted.
5. Outside first, then inside.
6. Center first, then both sides.
7. With "closed" characters, enter character first, then close it up.

CO LP 10.3.3	**Support ideas/opinions using compound sentences with adverb 因此**	
For example:		
Approaching	**Attaining**	**Expanding**
我们觉得／想……，**因为** ……。 We think ……, because….	这个人……，**因此**，我们认为…… This person ……., as a result, we think……	**由于**……，**因此**，我们认为…… Due to ……, as a result we think ……
....., 因为 (because)…… 因为 (because)……, 所以 (so)……	……，因此 (as a result, therefore), ……	由于 (due to)……, 因此 (as a result, therefore), we think……
Form focus: ……，因此 (as a result, therefore), ……		
因此 (as a result, therefore) is an adverb that can be used instead of the conjunction 因为 in the second clause.		
Noticing and awareness spotlight: Use of 由于 (due to)		
由于 (due to)……, reflects a more formal register and is more likely to be used in written communication.		

CO LP 10.3.4	**State purpose/function of a thing or an action using purpose verb phrase, 来 + verb + object**	
Approaching	**Attaining**	**Expanding**
科学家用科学方法验证假设。 A scientist uses the Scientific Method to test a hypothesis.	科学家用科学方法来验证假设。 A scientist uses the Scientific Method to test a hypothesis.	科学家需要用科学方法来验证假设。 A scientist needs to use the Scientific Method to test a hypothesis.
Subj. + $Verb_1$ + $Object_1$ + $Verb_2$ + $Object_2$ [$Verb_1$ and $Verb_2$ are parallel verbs. They are both actions performed by the same Subj.]	Subj. + Verb 用 + object + purpose verb phrase [来 + $Verb_2$ + $Object_2$].	Subj. + $Verb_1$ 需要 + $Verb_2$ 用 + $Object_1$ + purpose verb phrase [来 + $Verb_3$ + $Object_3$]

Form focus: Multiple uses of 来
1. "来" as an action verb, meaning "to come". e.g., 他昨天来过两次。 (He came twice yesterday.) 2. "来" is used to replace the verb in previous sentence. e.g., 把这杯茶**喝**完，我们再**来**一瓶！ (Drink up this cup of tea, we will drink another!) 3. "来" is placed in front of a verb phrase, indicating purpose. e.g., Juan Daniel **需要**水杯**来**喝水 。 (Juan Daniel needs a water bottle to drink water.) 4. "来" is used to indicate the direction of an action verb. e.g., 你把那本书拿来！ (Bring that book over here!)

CO LP 10.3.5	**State or identify what/who something is or is not like**	
For example:		
Approaching	**Attaining**	**Expanding**
她/他(不)是科学家。	我们(不)像科学家。	我们的角色跟 科学家(不)相似。
S/he is/is not a scientist.	We are/are not like a scientist.	Our role is/is not similar to that of a scientist.
Pronoun (她/他) + predicate [Verb 是 + noun].	Pronoun (我们) + negation + verb (像) + noun.	Noun phrase + preposition phrase (preposition 跟+ object) + verb (相似).
Form focus		
1. Stative verbs		
Stative verbs are used to describe situations that do not involve action. Examples include 喜欢 'to like,' 爱 'to love,' 像 'to resemble,' 想'to want,' 要 'to want,'需要 'to need,' 怕 'to fear,' 尊敬'to respect,' 感谢 'to appreciate,'懂 'to understand,'信 'to believe,' and 想念 'to miss.' 这个人像工程师. (This person resembles an engineer.) Stative verbs can be modified by adverbs of degree. The adverb will be placed directly in front of the stative verb. For example, 这个物品很像飞机. (This object looks a lot like an airplane.)		

2. Negation with 不 (bú)
不 (bú) is an adverb that means “not.” Like most adverbs, 不 (bú) always appears before the verb, in this case, 是. 这 is a pronoun and means "this, these." It may or may not be followed by a classifier (CL) and a noun, for example, 这个人是工程师. (This person is an engineer.) 这是工程师. (This is an engineer.)
3. Use of preposition 跟
The preposition/coverb 跟 has several different uses. A useful sentence structure that uses this preposition is as follows: Subj./topic + preposition phrase (preposition 跟+ object) + verb + (noun phrase). 我想**跟**她／他做葡萄干实验。 I want to do the raisin experiment with her/him. Juan Daniel 和他的朋友们**跟**镇上的其他男孩子们比赛踢球。 Juan Daniel and his friends play soccer with the other boys in town.

CC LP 10.3.6	**Express a personal opinion**	
For example:		
Approaching	**Attaining**	**Expanding**
我觉得／想 …… I feel like/think…	在我看来…… It seems to me like…	我建议…… I suggest…
也许／可能 maybe, perhaps	对我来说，…… In my opinion, …	我的看法是…… My thoughts are…
	我认为…… I believe/think …	我是说…… What I mean is…

Learning Activity 4

1. Draw students' attention to the Scientists/Engineers Compare and Contrast Chart on page 8 of MMIC 10-IWB and in their science journals. Ask students to turn to a neighbor and read out loud their compare-contrast chart notes about scientists to each other. Partners should verify that they have the same phrases written down with accurate character formation.
2. Ask for volunteers to read their charts out loud.
3. Call students' attention again to the *Juan Daniel,* Chapter 6 title "设计薄膜模型 (Modeling a Membrane)." This time, highlight the word "模型 (modeling)." Look at some examples to learn more about this new word and a related word, "model." One by one, display images of models that the students may be familiar with (e.g., model airplane, model home, model city, model rocket) as found on page 9 of MMIC 10-IWB. As each image is displayed, ask:

中文	English
它像什么?	What does this look like?

4. Once all of the images are displayed, ask:

中文	English
你可以说出以上这些东西有什么相同之处吗? (参考答案: 它们比实际上要小; 玩具; 新想法的第一份草图; 假想的东西)	What do these pictures have in common? (Possible answers: They are smaller versions of something bigger; toys; the first draft of a new idea; not the real thing)
这些物品的功能是什么? (参考答案: 用来表示一个人的想像; 用来玩的; 用来展示一个新的想法或者说明那个想法变成实品会是怎样; 用来当样品)	What might these objects be used for? (Possible answers: To show someone else what a person is imagining; to build or play with; to try a new idea out or to see what the real thing might look like; to sell something to someone)
你可以想出一些其它模型的例子吗?	Can we think of any other examples of models?
你试过在制作一些东西之前, 先做初步计划吗?	When have you created something as a preliminary plan before making the real thing?
哪些人的工作是制作和使用物品或模型的? (建筑师、工程师、木匠, 等等)	What kinds of people create and use these kinds of objects, or models, in their work? (Architects, engineers, carpenters, etc.)

5. Tell the students that, in order to create models, engineers follow a design process. Pass out MMIC 10-3 (EiE® {4-1}): *The Engineering Design Process*, one for each student. Allow students time to read the handout, underlining words/ideas they recognize.
6. Next, ask students to share their handouts with a partner and compare recognized words/ideas. If students have underlined different things, they should explain new words/ideas to their partners.
7. Regroup as a whole class and ask students to share what they recognize and ask questions about what they don’t recognize. Address any severe misunderstandings or misconceptions, but resist deliberating on each point of the Engineering Design Process. Tell students that they will become very knowledgeable about the five steps of the Engineering Design Process, and they will begin constructing their knowledge by reading about how Juan Daniel uses this process to solve his frog problem.
8. Distribute MMIC 10-4: *Chapter 6 Paragraph on the Engineering Design Process*, one per pair, to the partners who have been working together. Have students work with their partners to read the paragraph from Chapter 6 that is at the top of their handout. In this paragraph, Ms. Peters introduces the steps in the Engineering Design Process. The students’ task is to see if they can find the words/phrases in the paragraph that describe the five steps of the engineering design process and then draw a picture or graphic to represent each step.
9. After students have finished MMIC 10-4, display a copy of the empty MMIC 10-4 table of the Engineering Design Process on page 11 of the MMIC 10-IWB. Take the necessary time to explore students’ attempts to find the language from the paragraph on MMIC 10-4 that corresponds to the five steps of the Engineering Design Process. Invite a few students to show or talk about the pictures/symbols they created for each step. This is the “big idea” of the unit and very important to articulate; yet the students will read Chapter 6 next and move through several more activities to solidify their understandings.

Language Function-Form-Vocabulary Connections (Activity 4)	
CO LP 10.4.1	**Use a developing understanding of basic units of word formation in Chinese to infer and construct meaning with written text**
Form focus: radical → character → compound/word	
1. radical	
A radical is the smallest meaningful orthographic unit in compound characters, for example, 虫 (insect) is used in the character 蛙 (frog). 虫 (insect) can also be a stand-alone character. There are three types of radicals: semantic (give information about character meaning) [手 (hand)], phonetic (give information about character pronunciation) [分 (fen) in the compound 纷 (one after another)], and perceptual (do not give information about character meaning or pronunciation, instead function as visual fillers) [此 (this, these in classical Chinese), however, in the compound 嘴 (mouth) the radical 此 functions as a perceptual radical providing information about neither meaning nor pronunciation].	
2. character	
A Chinese character is a meaningful orthographic unit that is always pronounced as one syllable. Chinese characters have evolved as a writing system over millennia and have developed in various ways. Some characters are **pictographs** that were originally drawings of concrete objects, for example, 雨 (rain), the four dots depicting the rain coming down from the sky; others are better described as **ideographs** because they were created as graphic representations of more abstract ideas such as the notion of "above", 上, the stroke above the horizontal line indicating the idea of "above" or "up." Another way to create characters was to combine two or more pictographs or ideographs to portray a new meaning, for example, 休 (to rest), a combination of the pictographs for person, 人, and a person leaning against a tree, 木. These types of characters are referred to as **ideogrammatic characters**. Over 90% of Chinese characters were created as **phono-semantic compound characters** and are made up of a combination of semantic and phonetic radicals. For example，控 (to control), the semantic radical on the left side,手 (hand) , indicates that the word meaning will include an action with a hand, and the phonetic radical on the right side 空 (kōng), helps the reader with character pronunciation "kòng."	
3. compound	
Compounds consist of at least two characters, neither of which is an affix, a character that on its own lacks meaning but when added to other characters becomes a meaningful unit. Most Chinese words are compounds. Compounds have various types of syntactic relationships. A few compound types: *Verb-Object:* 踢足球 (to kick soccer ball)、开球 (to kick of)、发誓 (to pledge) *Verb-Complement*: 摔倒 (to fall down)、改进 (to improve and get better)、进来 (to come in) *Subject-Predicate*: 天亮 (bright [sky is bright])	

Number-Classifier: 各种 (various kinds)、一道 (a ray of…)、一片 (a patch of…) *Adverb-Verb*: 慢跑 (to jog [to run slowly])、快走 (to hurry [to walk fast]) *Verb-Verb-Noun*: 栖息地 (habitat [to stay and rest at a place]) *Adjective-Adjective-Noun*: 浅桃色 (light peach color)、吉祥物 (mascot [happy and auspicious object])
4. word
A word is written with one or more Chinese characters. A word can consist of a single character (脚, foot), a compound (幸运, lucky), a duplicate (招招手, to wave), or an affixed form (第一, first， 第二, second, etc.).

CO LP 10.4.2	**Recognize and interpret semantic radicals as separate characters or as part of another character**	
For example: 言 (yán, speech), when used as a semantic radical, turns into 讠, e.g., 说 (to speak) 牛 (niú, ox), when used as a semantic radical, has two forms: 牜, e.g., 物 (object) or 牛, e.g., 告 (to tell)		
Approaching	**Attaining**	**Expanding**
Some semantic radicals can be stand-alone characters and do not change form when used as part of another character: 大 (big), 天 (sky/heaven/day) 虫(insect), 蛙 (frog) Some semantic radicals can only be part of other characters: 疒 (sick), 病 (illness, sick) 艹 (grass), 草 (grass)	Some semantic radicals change form when used as part of another character: 手 (hand) could be in the forms of 扌→ 把 ("bǎ") or 手→看 (look) 金 (gold) will be in the form of 钅→锻炼 (exercise)	Some less commonly used semantic radicals: 矢 (shǐ, arrow) as in 矮 (short) 身 (shēn, body) as in 躺 (to lie down)
Form focus		
1. Semantic radicals		
There are about 201 semantic radicals used in 7,000 characters listed in the *Statistics of Commonly Used Characters* 《现代汉语通用字表》 (1998). Among 201 radicals, 100 are frequently used in high frequency characters (Shen, 2007). Historically, semantic radicals are all integral characters. Take the above mentioned character 蛙 as an example: the left part of the character 虫 (insect) is a semantic radical and it suggests the meaning of this character		

"tadpole." However, 虫 by itself is also an independent character. A few semantic radicals, however, no longer appear as independent characters in modern Chinese.

Semantic radicals can cue the meaning of the compound characters. For example, more than 90% of compound characters with the semantic radical 手 (hand) have their meanings related to the hand or to the action of the hand (Jin, 1985). However, the semantic radical suggests only a general category of meaning of the compound; it does not provide a specific meaning or definition. Take the character 河 (river) for example: the semantic radical in this character is 氵 (water), which suggests that its meaning has some relationship only to water; it does not provide the exact meaning *river*.

2. Placement of semantic radicals

There are rules of thumb for where to place radicals:

1. Left part of the character
2. Right part of the character
3. Top part of the character
4. Bottom part of the character
5. Whole-word frames: 口 (surround), totally enclosed, and 疒 (sickness) or 辶 (to go, movement), examples of partially enclosed

CO LP 10.4.3	**Ask and answer questions using question words**	
For example:		
Approaching	**Attaining**	**Expanding**
…… 吗? Use of ma …… 是不是……? Is or is not?	谁……? (Who) 什么……? (What) 哪里……? (Where) 什么时候……? (When) 怎么……? (How) 为什么……? (Why)	几/多少? (How many) 哪(些)……? (Which)
Form focus: Placement of question words		
Most question words in English occur at the beginning of a sentence. However, question words in Chinese occur in a variety of positions. Generally, question words appear in the same position as the grammatical function they serve in the sentence. For example: 谁参加足球比赛? (Who is going to play the soccer game? ["Who" occurs in subject position]) 你看见几个足球运动员? (How many soccer players did you see? ["How many" is in the # position of the noun phrase # + classifier + noun])		

Noticing and awareness spotlight: Use of 吗？ 吧？ 呢？
A few particles are commonly used at the end of questions. 吧？ is used to invite agreement. 呢？ is a tag question meaning ", and you?" 吗？ is a question particle that is used when one expects a "yes" or "no" response.

CO LP 10.4.4	**State or identify what/who something looks like**	
For example:		
Approaching	**Attaining**	**Expanding**
这(不)是飞机。	这个物品(不)像飞机。	这个物品跟真正的飞机很相似。
This is an airplane.	This object (does not look) looks like an airplane.	This object is very similar to a real airplane.
Pronoun (这) + (negation) + verb (是) + noun.	Pronoun (这) + (CL + subj) + (negation) + verb (像) + noun.	Pronoun (这) + (CL + subj.) + preposition 跟 + noun phrase (adj. + 的 + noun) + adv. + verb.
Form focus		
1. Stative verbs		
Stative verbs are used to describe situations that do not involve action. Examples include 喜欢 'to like,' 爱 'to love,' 像 'to resemble,' 想'to want,' 要 'to want,'需要 'to need,' 怕 'to fear,' 尊敬'to respect,' 感谢 'to appreciate,'懂 'to understand,'信 'to believe,' and 想念 'to miss.' 这个人像工程师. (This person resembles an engineer.) Stative verbs can be modified by adverbs of degree. The adverb will be placed directly in front of the stative verb. For example, 这个物品很像飞机. (This object looks a lot like an airplane.)		
2. Use of negation adverb 不 (bú) with stative verbs		
不 (bú) is an adverb that means "not." Like most adverbs, 不 (bú) always appears before the verb, in this case, 像, a stative verb. For example, 这个人不像工程师. (This person does not seem like an engineer.)		

3. Use of preposition 跟
The preposition/coverb 跟 has several different uses. A useful sentence structure that uses this preposition is as follows: Subj./topic + preposition phrase (preposition 跟+ object) + verb + (noun phrase). 这个物品跟真正的飞机很相似。 This object is very similar to the airplane. Juan Daniel 和他的朋友们跟镇上的其他男孩子们比赛踢球。 Juan Daniel and his friends play soccer with the other boys in town.

CO LP 10.4.5	**State use/function of someone using nominalization and purpose verb phrase, 来 + Verb + Object**	
Approaching	**Attaining**	**Expanding**
我玩这个玩具。 I play with this toy.	这个物品是用来展示一个新的想法的 。 This object is used to try out a new idea.	这个物品的功能是用来表示一个人的想像的。 The function of this object is to show someone else what a person is imagining.
Subject + verb + object.	Subj. + verb 是+ nominalization [用来+ verb + object + 的].	Noun phrase [Pronoun + CL + noun + 的 to indicate possession + noun] + verb 是 + nominalization [用来+ verb + object + 的].
Form focus		
1. Nominalization using 的		
A verb/verb phrase can become a noun by placing the particle 的(de) after it. For example, the verb phrase 你说 (you say) can function as a noun phrase 你说 的, meaning "what you say" in 你说的是 (What you say is…). • If the subject is expressed in the verb phrase 你说 (you say), it is likely that the noun phrase,你说 的 (what you say), will function as the direct object in the sentence, in this case, the "what" you say. • If the direct object is expressed in the verb phrase, e.g., 种水果 (grow fruit), it is likely that the noun phrase, 种水果的, will function as the subject of the sentence, as that is the information that is lacking.		

2. Multiple uses of 来
1. "来" as an action verb, meaning "to come". e.g., 他昨天来过两次。 (He came twice yesterday.) 2. "来" is used to replace the verb in previous sentence. e.g., 把这杯茶**喝**完，我们再**来**一瓶！ (Drink up this cup of tea, we will drink another!) 3. "来" is placed in front of a verb phrase, indicating purpose. e.g., Juan Daniel **需要**水杯**来**喝水 。 (Juan Daniel needs a water bottle to drink water.) 4. "来" is used to indicate the direction of an action verb. e.g., 你把那本书拿来！ (Bring that book over here!)
Noticing and awareness spotlight: Placement of preposition/coverb
Prepositions/coverbs such as **为了** (for the purpose of) introduce a noun phrase. Together, the preposition + noun phrase combination are typically placed before the main SVO in the sentence. In sentence initial position they add emphasis.

CC LP 10.4.6	**Ask for clarification about feedback/advice/idea**	
For example:		
Approaching	**Attaining**	**Expanding**
你说什么? What did you say? 我不懂。 I didn't understand that. 什么意思? What does it mean?	我没听懂，请你再说一次。 I didn't understand, could you please say it again? 你是不是说…… Did you say… 你说的是……的意思吗? Does what you said mean…?	你可不可以重复一遍? Could you repeat it one more time? 请你再跟我讲一讲。 Please explain it to me one more time. 你可以给我解释一下吗? Could you explain that to me?
Form focus: Nominalization using 的 (e.g., 你说的是……)		
A verb/verb phrase can become a noun by placing the particle 的 (de) after it. For example, the verb phrase 你说 (you say) can function as a noun phrase 你说的, meaning "what you say" in 你说的是 (What you say is…).		
Noticing and awareness spotlight: Use of 吗? 吧? 呢?		
A few particles are commonly used at the end of questions. 吧? is used to invite agreement. 呢? is a tag question meaning "…, and you?" 吗? is a question particle that is used when one expects a "yes" or "no" response.		

CC LP 10.4.7	**Negotiate turn-taking**	
For example:		
Approaching	**Attaining**	**Expanding**
该我了! My turn! 到你了! Your turn! 下一个是谁? Who's next? 下一个是你吗? Are you the next one?	下一个该轮到谁了? Who is the next? 我觉得该你了。 I think it's your turn. 大家都在等你呢! All of us are waiting for you!	如果你不赶紧，我们都不能往下进行。 If you don't hurry, none of us can move on to the next.

CC LP 10.4.8	**Express a personal opinion and request agreement**	
For example:		
Approaching	**Attaining**	**Expanding**
我觉得／想 ……, 你呢? I feel like/think……， and you? 也许／可能, 你呢? Maybe/perhaps…., and you?	在我看来…… ……, 你也同意吗? It seems to me like…, do you agree? 对我来说, ……,你也同意吗? In my opinion, ….., do you agree? 我认为……,你也同意吗? I believe/think …, do you agree?	我建议……,你也是这么想的吗? /吧? I suggest…, do you think so? 我的看法是……,你也是这么想的吗? /吧? My thoughts are……, do you think so? 我是说……,你也是这么想的吗? /吧? What I mean is……, do you think so?
Noticing and awareness spotlight: Use of 吗? 吧? 呢？		
A few particles are commonly used at the end of questions. 吧? is used to invite agreement. 呢? is a tag question meaning ", and you?" 吗? is a question particle that is used when one expects a "yes" or "no" response.		

Adaptation of EiE® story *Juan Daniel's Fútbol Frog*, Chapter 6

Focused Learning Phase—"Through" activities

The teacher will read *Juan Daniel*, Chapter 6 to the students as they follow along in their packets. The teacher will use visuals and gestures to present new vocabulary and cultural concepts. Students will work in small groups to answer comprehension questions about each section of the chapter.

Time: Learning Activity 5—40 minutes
Learning Activity 6—40 minutes

Learning Activity 5

1. Congratulate students on already reading a paragraph from *Juan Daniel,* Chapter 6 on their own, and have them get their story packets out to continue with Chapter 6.
2. Read *Juan Daniel,* Chapter 6 to the class using a "Numbered Heads Together" activity to have the class answer comprehension questions about the text as it is read:
    a. Put the students into groups of 3-4.
    b. Assign each student in the group a number (1-3 or 1-4, depending on the number of students in each group).
    c. Read Chapter 6 to the students as they follow along in their packets. Use visuals and gestures to present new vocabulary and ensure comprehension of main ideas. Read the text in sections (as indicated below).
    d. At the end of each section, display a comprehension question on page 10 of MMIC 10 IWB for the groups to discuss. Give them time to discuss and prepare to answer the question in their groups. Remind students that they are to work together to make sure that everyone in their group is prepared to give their group's answer if called on.
    e. Choose a number (1-3 or 1-4) and have the "numbered" student in each group stand up. Choose one of those students to orally answer the question for the whole class. If the answer is incorrect or needs further clarification, continue to invite those students who are standing to respond to the question.
    f. Then read the next section of the chapter. Continue with reading and "Numbered Heads Together" questions until the end of the chapter.

Comprehension questions for each section:

Section 1: Read page 27 (page 35-36 in Chinese version：从"第二天吃完午饭，……"到"你肯定还会赢！" Marcela 说。), "The next day after lunch…I'm sure of it! said Marcela."

***Note*:** *Use this passage to ask students to notice the correct use of punctuation when quoting what others are saying in a story and briefly review other types of punctuation as well. Quotation marks are used to represent someone's exact words. If the quotation is a complete sentence on its own, the period, question mark or exclamation point is placed inside the quotation marks.*

Below are two examples in this section of the story:

中文	English
"你还在看这只青蛙呢？" Marcela 问道。	"You're still thinking about that frog?" she asked.
"你肯定还会赢！" Marcela 说。	"You'll win again. I'm sure of it!" said Marcela

After calling attention to use of punctuation, ask the student groups to discuss the following question, and, when ready, call on a number to share their answers with the class:

中文	English
为什么 Juan Daniel 想把青蛙留在身边更久一点?	Why does Juan Daniel want to keep his frog a little while longer?

Section 2: Read pages 27-28 (page 36 in Chinese version：从"Juan Daniel 对她笑了笑，……"到"我已经有一些主意了。"), "Juan Daniel smiled at her…imagining some ideas." Ask the student groups to discuss the following question, and, when ready, call on a number to share their answers with the class:

中文	English
Juan Daniel 要解决什么问题?	What problem is Juan Daniel trying to solve?

Section 3: Read page 28 (page 37 in Chinese version：从"你听起来像个科学家似的！……"到"…… 只要能保持青蛙皮肤的湿润就行。"). "You sound like a scientist…keep the frog moist." Ask the student groups to discuss the following question, and, when ready, call on a number to share their answers with the class:

中文	English
Juan Daniel 想出了什么方法来帮助青蛙?	What solution does Juan Daniel imagine for his frog's problem?

Use the picture on page 31 (page 40 in the Chinese version) to illustrate Juan Daniel's idea. Show students that there will be two containers: a bottom one for the frog and a top one for the water with a model membrane separating the two.

Section 4: Read pages 28-29 (pages 38-39 in Chinese version：从"我懂了！……"到"…… 一个星期只能从井里打两次水，我们不可能常常给它换水。"). "I get it…from the well twice a week." Use the picture on pages 29 to illustrate Juan Daniel's idea. Call attention to the water

tank in the picture and show a picture of a "well" on page 9 of the MMIC 10-IWB, as these may be unfamiliar concepts for students.

Teacher Tip: *Internet resource for pictures of Salvadoran wells and water towers: http://groups.engr.orst.edu/ewb/projects/el_salvador_project)*

Ask the student groups to discuss the following question, and, when ready, call on a number to share their answers with the class:

中文	English
为什么设计薄膜模型的重点在于让水一点一滴地流下来?	Why is it important to design a model membrane that lets just a sprinkle of water pass through?

Section 5: Read pages 29-30 (pages 39-42 in Chinese version：从"听起来你已经有头绪了。……"到"……也把它剪开试一试。"Juan Daniel 说。). "It sounds like you're off…'T-shirt that we could cut up' said Juan Daniel." Ask the student groups to discuss the following question, and, when ready, call on a number to share their answers with the class:

中文	English
Peters 女士是如何帮助 Juan Daniel 解决问题的?	How does Ms. Peters help Juan Daniel with his problem?

Section 6: Read pages 30-32 (pages 42-43 in Chinese version：从"这些都是很好的材料。……"到"…… 走出门外。"). "That's great…was out the door."). Show a picture of a "tecomate" on the whiteboard as this section is read and talk about what it is used for (to collect and carry water). Point out that the Chinese people have something like a "tecomate", too: A "葫芦" was used for carrying wine and water in the old days. Show the picture of the "葫芦" (a green gourd) on page 13 of MMIC 10-IWB. Ask the student groups to discuss the following question, and, when ready, call on a number to share with the class their answers:

中文	English
为什么 Juan Daniel 送葫芦给 Peters 女士? 他希望这份礼物会什么作用?	Why does Juan Daniel give Ms. Peters a tecomate? What does he hope this gift will do?

3. Discuss giving a gift as a cultural practice for leave-taking in El Salvador. Extend the discussion to ways of saying good-bye in the US and China and add this information to the cross-cultural wall chart. How do we say good-bye in the US?

Note: *In ancient China, people used to bend a willow branch for a send-off.* 折柳送别. *The character for* 柳 *"willow" is a homophone with the verb* 留 *(liu) "stay." It has a hidden meaning:*

We want the friends to stay and will miss them a lot. On the other hand, the willow can adjust with the environment easily, which means to the friends that they will adjust to their new environment quickly. Nowadays, people in China may give a gift when saying good-bye, depending on their relationship. As in this Salvadoran custom, the gift may be something from their region.

Section 7: Read page 32 (page 43-44 in Chinese version：从"Juan Daniel 和 Marcela 在家里找来各种各样的材料：……"到"…… 我自己准备好了吗？"). "Together, Juan Daniel and Marcela…am I ready?" Ask the student groups to discuss the following question, and, when ready, call on a number to share with the class their answers:

中文	English
制作薄膜模型的时候，Juan Daniel 和 Marcela 都做了什么？	What were some of the things Juan Daniel and Marcela did as they prepared their model membrane?

4. After finishing Chapter 6, asks students to share with each other (in their groups) what was most interesting in the chapter: Learning about gift-giving, learning about the Engineering Design Process, or thinking about the materials Juan Daniel and Marcela tested. Ask for volunteers to share their answers with the class.

Language Function-Form-Vocabulary Connections (Activity 5)	
CO LP 10.5.1	**Use a developing understanding of basic units of word formation in Chinese to infer and construct meaning with written text**
Form focus: radical → character → compound/word	
1. radical	
A radical is the smallest meaningful orthographic unit in compound characters, for example, 虫 (insect) is used in the character 蛙 (frog). 虫 (insect) can also be a stand-alone character. There are three types of radicals: semantic (give information about character meaning) [手 (hand)], phonetic (give information about character pronunciation) [分 (fen) in the compound 纷 (one after another)], and perceptual (do not give information about character meaning or pronunciation, instead function as visual fillers) [此 (this, these in classical Chinese), however, in the compound 嘴 (mouth) the radical 此 functions as a perceptual radical providing information about neither meaning nor pronunciation].	
2. character	
A Chinese character is a meaningful orthographic unit that is always pronounced as one syllable. Chinese characters have evolved as a writing system over millennia and have developed in various ways. Some characters are **pictographs** that were originally drawings of concrete objects, for example, 雨 (rain), the four dots depicting the rain coming down from the sky; others are better described as **ideographs** because they were created as graphic representations of more abstract ideas such as the notion of "above", 上, the stroke above the horizontal line indicating the idea of "above" or "up." Another way to create characters was to combine two or more pictographs or ideographs to portray a new meaning, for example, 休 (to rest), a combination of the pictographs for person, 人, and a person leaning against a tree, 木. These types of characters are referred to as **ideogrammatic characters**. Over 90% of Chinese characters were created as **phono-semantic compound characters** and are made up of a combination of semantic and phonetic radicals. For example, 控 (to control), the semantic radical on the left side,手 (hand) , indicates that the word meaning will include an action with a hand, and the phonetic radical on the right side 空 (kōng), helps the reader with character pronunciation "kòng."	
3. compound	
Compounds consist of at least two characters, neither of which is an affix, a character that on its own lacks meaning but when added to other characters becomes a meaningful unit. Most Chinese words are compounds. Compounds have various types of syntactic relationships. A few compound types: *Verb-Object:* 踢足球 (to kick soccer ball)、开球 (to kick of)、发誓 (to pledge) *Verb-Complement*: 摔倒 (to fall down)、改进 (to improve and get better)、进来 (to come in) *Subject-Predicate*: 天亮 (bright [sky is bright]) *Number-Classifier*: 各种 (various kinds)、一道 (a ray of…)、一片 (a patch of…)	

Adverb-Verb: 慢跑 (to jog [to run slowly])、快走 (to hurry [to walk fast]) *Verb-Verb-Noun*: 栖息地 (habitat [to stay and rest at a place]) *Adjective-Adjective-Noun*: 浅桃色 (light peach color)、 吉祥物 (mascot [happy and auspicious object])
4. word
A word is written with one or more Chinese characters. A word can consist of a single character (脚, foot), a compound (幸运, lucky), a duplicate (招招手, to wave), or an affixed form (第一, first， 第二, second, etc.).

CO LP 10.5.2	**Recognize and interpret semantic radicals as separate characters or as part of another character**

For example:
言 (yán, speech), when used as a semantic radical, turns into 讠, e.g., 说 (to speak)
牛 (niú, ox), when used as a semantic radical, has two forms: 牜 , e.g., 物 (object) or 牲, e.g., 告 (to tell)

Note: *At the end of this lesson you will find a table that provides 50 most frequently used radicals.*

Approaching	**Attaining**	**Expanding**
Some semantic radicals can be stand-alone characters and do not change form when used as part of another character: 大 (big), 天 (sky/heaven/day) 虫(insect), 蛙 (frog) Some semantic radicals can only be part of other characters: 疒 (sick), 病 (illness, sick) 艹 (grass), 草 (grass)	Some semantic radicals change form when used as part of another character: 手 (hand) could be in the forms of 扌→ 把 ("bǎ") or 手→看 (look) 金 (gold) will be in the form of 钅→锻炼 (exercise)	Some less commonly used semantic radicals: 矢 (shǐ, arrow) as in 矮 (short) 身 (shēn, body) as in 躺 (to lie down)

Form focus
1. Semantic radicals
There are about 201 semantic radicals used in 7,000 characters listed in the *Statistics of Commonly Used Characters* 《现代汉语通用字表》 (1998). Among 201 radicals, 100 are frequently used in high frequency characters (Shen, 2007). Historically, semantic radicals are all integral characters. Take the above mentioned character 蛙 as an example: the left part of the character 虫 (insect) is a semantic radical and it suggests the meaning of this character

"tadpole." However, 虫 by itself is also an independent character. A few semantic radicals, however, no longer appear as independent characters in modern Chinese. Semantic radicals can cue the meaning of the compound characters. For example, more than 90% of compound characters with the semantic radical 手 (hand) have their meanings related to the hand or to the action of the hand (Jin, 1985). However, the semantic radical suggests only a general category of meaning of the compound; it does not provide a specific meaning or definition. Take the character 河 (river) for example: the semantic radical in this character is 氵 (water), which suggests that its meaning has some relationship only to water; it does not provide the exact meaning *river*.
2. Placement of semantic radicals
There are rules of thumb for where to place radicals: 1. Left part of the character 2. Right part of the character 3. Top part of the character 4. Bottom part of the character 5. Whole-word frames: 口 (surround), totally enclosed, and 疒 (sickness) or 辶 (to go, movement), examples of partially enclosed

CO LP 10.5.3	**Ask and answer questions using question words**	
For example:		
Approaching	**Attaining**	**Expanding**
…… 吗? Use of ma …… 是不是……? Is or is not?	谁……? (Who) 什么……? (What) 哪里……? (Where) 什么时候……? (When) 怎么……? (How) 为什么……? (Why)	几/多少? (How many) 哪(些)……? (Which)
Form focus: Placement of question words		
Most question words in English occur at the beginning of a sentence. However, question words in Chinese occur in a variety of positions. Generally, question words appear in the same position as the grammatical function they serve in the sentence. For example: 谁参加足球比赛? (Who is going to play the soccer game? ["Who" occurs in subject position]) 你看见几个足球运动员? (How many soccer players did you see? ["How many" is in the # position of the noun phrase # + classifier + noun])		

Noticing and awareness spotlight: Use of 吗？ 吧？ 呢？
A few particles are commonly used at the end of questions. 吧？ is used to invite agreement. 呢？ is a tag question meaning ", and you?" 吗？ is a question particle that is used when one expects a "yes" or "no" response.

CO LP 10.5.4	**Recount events in simple past time using action verbs with 了 (temporal marker) and dependent time phrase/clause in complex sentence**	
For example:		
Approaching	**Attaining**	**Expanding**
Juan Daniel 告诉了他的妹妹他的计划。 Juan Daniel talked about his plan with his sister.	Juan Daniel 想出了他的想法后，他请求 Ms Peters 的帮助 After Juan Daniel thought about his idea, he asked Ms. Peters for some help.	正当 Ms Peters 要离开的时候，Juan Daniel 给了她一个 tecomate 让她记得他。 When Ms. Peters was about to leave, Juan Daniel gave her a tecomate so that she could remember him.
Simple past time using action verb with temporal marker 了	Use of dependent time phrase in complex sentence and temporal marker 了	Use of dependent time clause in complex sentence and temporal marker 了

Form focus: Use of 把- and 让/使-construction
Similar to "把-sentence," the "让/使-construction" allows one to place the direct object in front of the main verb, which is not typical word order in Chinese. This draws more attention to what is happening to the object itself.
Form focus
1. Use of 了 as temporal marker
Simple past time can be communicated using 了 (temporal marker), e.g., action verb + 了 (temporal marker). The temporal marker "了" is positioned either immediately after the main verb or at the end of the sentence/clause.
2. Use of dependent time phrase/clause in complex sentence
Mandarin uses prepositions as linking words to connect two clauses and form one complex sentence. When the first clause is dependent on the second clause to complete its meaning, prepositions will be placed at the end of the first clause. The first clause may consist of a time phrase [noun + preposition] (e.g., 足球比赛的时候, ……) or a time clause [simple SVO sentence + preposition] (e.g., 正当他鼓足劲儿要出脚的时候, ……).

For example, Noun/simple SVO sentence + 以后 (after)，+ main clause. Noun/simple SVO sentence + 以前 (before)，+ main clause. Noun/simple SVO sentence + 的时候 (when/while at)，+ main clause.
Noticing and awareness spotlight:
1. Use of temporal marker "了" with "verb + verb complement" structure
When a two-character "verb + verb complement" structure is used, the temporal marker "了" must be placed after the verb complement. For example, ［我］看到**了**。(I saw.) However, if the verb complement consists of two characters instead of just one, then "了" can be placed either after the one-character first main verb or after the two-character verb complement. For example, 他走**了**出来。(He walked out of there.) 他走出来**了**。(He walked out of there.)

CO LP 10.5.5	**Support ideas/opinions using compound sentences with adverb 因此**	
For example:		
Approaching	**Attaining**	**Expanding**
我们觉得／想……，**因为** ……。 We think ……, because….	这个人……，**因此**，我们认为…… This person ……., as a result, we think……	**由于**……，**因此**，我们认为…… Due to ……, as a result we think ……
....., 因为 (because)…… 因为 (because)……, 所以 (so)……	……，因此 (as a result, therefore), ……	由于 (due to)……, 因此 (as a result, therefore), we think……
Form focus: ……，因此 (as a result, therefore), ……		
因此 (as a result, therefore) is an adverb that can be used instead of the conjunction 因为 in the second clause.		
Noticing and awareness spotlight: Use of 由于 (due to)		
由于 (due to)……, reflects a more formal register and is more likely to be used in written communication.		

CC LP 10.5.6	**Express a personal opinion**	
For example:		
Approaching	**Attaining**	**Expanding**
我觉得／想 …… I feel like/think… 也许／可能 maybe, perhaps	在我看来…… It seems to me like… 对我来说，…… In my opinion, … 我认为…… I believe/think …	我建议…… I suggest… 我的看法是…… My thoughts are… 我是说…… What I mean is…

CC LP 10.5.7	**Express agreement/disagreement**	
For example:		
Approaching	**Attaining**	**Expanding**
好。 Good. 我同意。 I agree. 我也是／同意。 I also + verb (am/agree). 对。 Exactly/Correct.	你说得对。 You are correct. 你完全正确。 You're absolutely right. 我也是这么认为的。 I think so too. 我也不这么认为。 I don't think so either.	我的想法跟你的一样。 I share your thoughts. 我赞成。 I agree (more formal). 我完全赞同。 I agree with you entirely.
不。 No. 不好。 Not good。 不同意。 I don't agree with you. 不对。 Not exactly.	我不是这么认为的。 I don't think so. 是，可是你不觉得……? Yes, but don't you think… 我觉得我不同意。 I'm afraid I have to disagree。	我的意见跟你的不同。 My suggestions are different from yours. 我想和你讨论讨论…… I must take issue with you on that. 然而 However

Noticing and awareness spotlight: Repetition of verb
Repetition of a verb, e.g., 讨论讨论 (to discuss), can be used to soften the tone of voice.

CC LP 10.5.8	**Negotiate to reach consensus**	
For example:		
Approaching	**Attaining**	**Expanding**
好吧。 OK. 我同意。 I agree.	我同意你的想法。 I agree with your idea. 我也一样。 Same here.	不约而同。 We reach the consensus without consulting with each other.
Noticing and awareness spotlight: Use of 吗？吧？ 呢？		
A few particles are commonly used at the end of questions. 吧？ is used to invite agreement. 呢？ is a tag question meaning “, and you?” 吗？ is a question particle that is used when one expects a “yes” or “no” response.		

Learning Activity 6

1. Return to the Scientist/Engineer compare-contrast chart. Using the same questions as before, work with students to fill in the column about engineers. As students suggest answers to each question, write key ideas onto the compare-contrast chart and have students copy the information to the compare-contrast chart in their science notebooks. Ask:

中文	English
谁? 工程师做什么? 为什么工程师设计模型? 工程师工作的时候用什么方法或程序?	• Who? • What do engineers do? • Why do engineers design models? • What method or process do engineers use in their work?

See sample compare-contrast chart for "scientists" below):

Compare-Contrast Chart: Scientists and Engineers

谁?	科学家	工程师
Who?	**Scientists**	**Engineers**
他们做什么?	通过实验来验证假设	设计模型
What do they do?	Carry out experiments to test hypotheses	Design models
为什么?	了解我们生活的世界	解决实际问题
Why?	To learn about the world we live in	To solve real-world problems
他们工作的时候用什么方法或程序?	科学方法	工程设计步骤
What method do they use in their work?	The Scientific Method	The Engineering Design Process

2. While completing the final row of the Compare-Contrast Chart, "What are the steps in the engineering design process?", help students to connect the first two steps in the Engineering Design Process to the steps that Juan Daniel has already completed in trying to solve his frog problem:

   a. **Ask questions:** Draw big question marks on the whiteboard. Help students to notice that both scientists and engineers begin with the same step: They ask questions. Ask:

中文	English
Juan Daniel 要为青蛙解决什么问题?	What question was Juan Daniel trying to answer about his frog?

Add "提问 (ask questions)" to the compare-contrast chart and ask students to do the same.

b. **Imagine solutions:** Display page 14 of MMIC 10 IWB, the picture from the last page of *Juan Daniel,* Chapter 5. Ask:

中文	English
Juan Daniel 做了什么? 他去哪了? 为什么他要去那儿? (他去热带雨林了。他要找到一些启发来帮助问题的解决。他一直想解决办法。)	What did Juan Daniel do next? Where did Juan Daniel go? Why did he go there? (He went to the rain forest. He wanted to get ideas that would help him solve his problem. He was imagining solutions.)
他想出来的解决办法是什么? (做一个东西往青蛙身上滴水，保持它的湿润。)	What solution did he imagine? (Create something that will drip just enough water onto the frog to keep his skin moist.)

Add "思考 (imagine solutions)" to the compare-contrast chart and ask students to do the same.

c. **Plan design:** Display page 15 of MMIC 10 IWB, the last sentence from *Juan Daniel,* Chapter 5. Ask:

中文	English
Juan Daniel 接下来做了什么? (他要设计。)	What will Juan Daniel do next? (He will plan his design.)

Add "设计 (plan design)" to the compare-contrast chart and ask students to do the same.

d. **Create model:** Ask:

中文	English
按照工程设计步骤，下一步是什么? Juan Daniel 下一步要做什么? (他要制作模型。)	What do you think will be the next step in the Engineering Design Process? What will Juan Daniel do next? (He will create his model.)

Add "制作 (create model)" to the compare-contrast chart and ask students to do the same.

e. **Improve design:** Ask:

中文	English
你认为 Juan Daniel 的第一个模型能成功吗? 如果不成功, 他可能会做什么? 他可以改良他的设计和模型。	Do you think Juan Daniel's first model will work well? If not, what could he do next? (He could improve his design and model.)

Add "改进 (improve design and model)" to the compare-contrast chart and ask students to do the same. Here is what the final row of the compare-contrast chart about scientists and engineers will look like:

Compare-Contrast Chart: Scientists and Engineers

这个方法/程序有什么步骤?	第一步: 提出假设 第二步: 验证假设 第三步: 分析结果 第四步: 得出结论 第五步: 汇报结论	第一步: 提问 第二步: 思考 第三步: 设计 第四步: 制作 第五步: 改进
What are the steps for this method/process?	Step 1: Make hypothesis Step 2: Test hypothesis Step 3: Analyze results Step 4: Draw conclusion Step 5: Report conclusion	Step 1: Ask questions Step 2: Imagine solutions Step 3: Plan design Step 4: Create model Step 5: Improve design and model

3. Using the compare-contrast chart, lead students to the following key ideas, write them on the board, and have students write them in their science notebooks:

中文	English
科学家用科学方法通过实验来验证假设。	Scientists use the Scientific Method to test hypotheses with experiments.
工程师用工程设计步骤做模型来解决实际问题。	Engineers use the Engineering Design Process to create models to solve real-world problems.

Teacher Tip: *Consider telling a story from personal experience that provides a simple example of using the Engineering Design Process to solve a problem. Talk about each of the five steps as you tell your personal story.*

Language Function-Form-Vocabulary Connections (Activity 6)		
CO LP 10.6.1	**Ask and answer questions using question words**	
For example:		
Approaching	**Attaining**	**Expanding**
…… 吗? Use of ma …… 是不是……? Is or is not?	谁……? (Who) 什么……? (What) 哪里……? (Where) 什么时候……? (When) 怎么……? (How) 为什么……? (Why)	几/多少? (How many) 哪(些)……? (Which)
Form focus: Placement of question words		
Most question words in English occur at the beginning of a sentence. However, question words in Chinese occur in a variety of positions. Generally, question words appear in the same position as the grammatical function they serve in the sentence. For example: 谁参加足球比赛? (Who is going to play the soccer game? ["Who" occurs in subject position]) 你看见几个足球运动员? (How many soccer players did you see? ["How many" is in the # position of the noun phrase # + classifier + noun])		
Noticing and awareness spotlight: Use of 吗? 吧? 呢?		
A few particles are commonly used at the end of questions. 吧? is used to invite agreement. 呢? is a tag question meaning ", and you?" 吗? is a question particle that is used when one expects a "yes" or "no" response.		

CO LP 10.6.2	**Construct characters to form words and phrases adhering to character structure rules and stroke order guidelines**
For example: Left-right: 叫、场 Top-bottom: 吉、只 Left, middle, right: 树、谁 Top, middle, bottom: 复、常 One-part, totally enclosed: 国、回 Partially enclosed: 用，原	

Approaching	Attaining	Expanding
One- and two-part characters One-part character 我、生 One-part, totally enclosed 国、回 Two-part characters Left-right: 叫、场 Top-bottom: 吉、只	**Three-part characters** Left, middle, right: 树、谁 Top, middle, bottom: 复、常 Left, top-right, bottom-right: 锋、纷 Top-left, bottom-left, right: 部、剂、劲 Left-top, right-top, bottom: 然、赞 Top, left-bottom, right-top: 死、前	**Four + part characters** Left-top, right-top, left-bottom, right bottom: 能、舒 Left, top-right, middle-right, bottom-right: 慢、镜 Left, middle, top-right, bottom-right: 游 Left, middle-top, middle-bottom, right: 湖

Form focus: Formation of Chinese characters

1. Character structure rules

Chinese characters are called "square" characters because no matter how simple or complex, each character fits inside a square. Characters can usually be divided into different parts. These parts form character structures. There are four main structures: one-part structure, two-part structure, three-part structure, and four-part structure. These structures can be further divided into sub-parts.

For example,

Two-part structures:  (top/bottom),  (left/right)

Three-part structures:  (left, top-right, bottom-right),  (top-left, bottom-left, right), etc.

2. Stroke order guidelines

General rules for writing Chinese characters are:

1. Horizontal first, then vertical.
2. Top first, then bottom.
3. Left first, then right.
4. Left-slanted first, then right-slanted.
5. Outside first, then inside.
6. Center first, then both sides.
7. With "closed" characters, enter character first, then close it up.

CO LP 10.6.3	**Recount events in simple past time using action verbs with 了 (temporal marker) and dependent time phrase/clause in complex sentence**

For example:

Approaching	**Attaining**	**Expanding**
Juan Daniel 去热带雨林了。 Juan Daniel went to the rainforest.	当他在热带雨林的时候，他找到了一些启发来帮助他解决问题。 While in the rainforest, he got an idea that would help him solve his problem.	当 Juan Daniel 在热带雨林的时候，他想出了不同的解决办法。 When Juan Daniel was in the rainforest, he imagined different solutions.
Simple past time using action verb with temporal marker 了	Use of dependent time phrase in complex sentence and temporal marker 了	Use of dependent time clause in complex sentence and temporal marker 了

Form focus

1. Use of 了 as temporal marker

Simple past time can be communicated using 了 (temporal marker), e.g., action verb + 了 (temporal marker). The temporal marker "了" is positioned either immediately after the main verb or at the end of the sentence/clause.

2. Use of dependent time phrase/clause in complex sentence

Mandarin uses prepositions as linking words to connect two clauses and form one complex sentence. When the first clause is dependent on the second clause to complete its meaning, prepositions will be placed at the end of the first clause. The first clause may consist of a time phrase [noun + preposition] (e.g., 足球比赛的时候, ……) or a time clause [simple SVO sentence + preposition] (e.g., 正当他鼓足劲儿要出脚的时候, ……).

For example,
Noun/simple SVO sentence + 以后 (after)，+ main clause.
Noun/simple SVO sentence + 以前 (before)，+ main clause.
Noun/simple SVO sentence + 的时候 (when/while at)，+ main clause.

Noticing and awareness spotlight

1. Use of temporal marker "了" with "verb + verb complement" structure

When a two-character "verb + verb complement" structure is used, the temporal marker "了" must be placed after the verb complement.

For example,
［我］看到**了**。(I saw.)

However, if the verb complement consists of two characters instead of just one, then "了" can be placed either after the one-character first main verb or after the two-character verb complement.
For example,
他走了出来。(He walked out of there.)
他走出来了。(He walked out of there.)

CO LP 10.6.4	**State purpose/function of a thing or an action using purpose verb phrase, 来 + verb + object**	
Approaching	**Attaining**	**Expanding**
科学家用科学方法验证假设。 A scientist uses an experiment to test a hypothesis. 工程师用模型解决实际问题。 An engineer uses a model to solve real-world problems.	科学家用科学方法通过实验来验证假设。 Scientists use the Scientific Method to test hypotheses with experiments. 工程师用工程设计步骤做模型来解决实际问题。 Engineers use the Engineering Design Process to create models to solve real-world problems.	科学家需要验证假设来得出结论。 A scientist needs to test a hypothesis to draw a conclusion. 工程师需要想像可能性的解决方法来设计模型。 An engineer needs to imagine possible solutions to design a model.
Subj. + $Verb_1$ + $Object_1$ + $Verb_2$ + $Object_2$ [$Verb_1$ and $Verb_2$ are parallel verbs. They are both actions performed by the same Subj.]	Subj. + $Verb_1$ 用 + $Object_1$ + purpose verb phrase [来 + $Verb_2$ + $Object_2$]	Subj. + $Verb_1$ 需要 + $Verb_2$ 用 + $Object_1$ + purpose verb phrase [来 + $Verb_3$ + $Object_3$]
Form focus		
1. 来 (lái) + verb phrase [verb + object], indicating purpose		
Here, the verb 来 (lái) no longer functions as a verb meaning "to come/go", rather it becomes a marker that takes on the meaning of "for the purpose of" and helps to connect two verbs. For example, Juan Daniel 用水杯来喝水。Juan Daniel uses a water bottle for the purpose of drinking water. 我们需要足球场／球队来踢足球。We need a soccer field to play soccer (for the purpose of playing soccer).		

2. Placement of prepositional phrase
A useful sentence structure that uses a prepositional phrase is as follows: Subj./topic + preposition phrase (preposition + object) + verb + (noun phrase). 科学家用科学方法通过实验来验证假设。 Scientists use the Scientific Method to test hypotheses with experiments. Juan Daniel 和他的朋友们跟镇上的其他男孩子们比赛踢球。 Juan Daniel and his friends play soccer with the other boys in town.

CO LP 10.6.5	**Predict degree of probability of something using auxiliary "helping" verbs**	
For example:		
Approaching	**Attaining**	**Expanding**
我想 Juan Daniel **可能**做一个薄膜模型。 I think Juan Daniel is likely to make a model membrane.	我觉得／想 Juan Daniel 会设计一个薄膜模型。 I feel like/think Juan Daniel will design a model membrane.	在我看来，Juan Daniel 接下来要设计一个薄膜模型。 It seems to me that Juan Daniel will create a model membrane next.
Use of adverb "可能" to express future possibility.	Use of auxiliary 会 + main verb 设计	Use of adverb of time 接下来 (next) + auxiliary 要 + main verb 设计+ object phrase
Form focus		
1. Auxiliary "helping verbs"		
In Mandarin, auxiliary "helping verbs" indicate the ability, possibility, intention or desire to carry out an action. The following are examples of auxiliary "helping verbs": 会 'will likely + verb', 会 'will know + verb', 能/可以'able to + verb', 要/应该'ought to + verb', 要/想'want to + verb', 可以'allow to + verb', 不可以'prohibited to + verb'.		
2. How auxiliary "helping verbs" are same/different from other verbs		
Like other verbs, auxiliary verbs… 1. occur as the A element in A-not-A questions, for example, 薄膜的孔应该不应该很小? (Should the holes of a membrane be small?); 2. be negated, or example: 薄膜的孔不应该很大。(The holes of a membrane should not be big.)		

Unlike other verbs, auxiliary verbs …

a. must co-occur with a verb or an assumed verb;
For example, 薄膜的孔应该不应该很小？(Should the holes of a membrane be small?)
b. does not take aspect markers such as 了(le), 过(guò), 着 zhe;
c. cannot be modified by intensifiers, such as 很 (very) or 更 (even more);
d. cannot be nominalized;
e. cannot occur before the subject;
f. cannot take a direct object.

Noticing and awareness spotlight

1. three uses of character 会

a. 会 as a verb (to know). For example: 我**会**中文。(I know Chinese.)

b. 会 as an auxiliary + verb (specifies a learned, acquired and usually mental ability: "know how to" or "to learn how"). For example: 我**会**踢足球 。(I know how to play soccer.)

c. 会 as an auxiliary + verb (refers to the likelihood of the occurrence of an event: "will", "most likely"). For example: 冠军赛明年会在这里举行。(The championship game will be held here next year.)

2. the difference between 能 and 会

能 and 会 are both auxiliary verbs meaning "can" or "may." They are used interchangeably. However, there is a difference between them:
会 (huì) specifies a learned, acquired skill or a mental ability;

能 (néng) means having the physical ability or opportunity to do something unless a condition prevents it. It is always followed by an action verb (or an action verb is understood).

For example:
我**会**设计薄膜模型，但是我现在不**能**，因为我没有合适的材料。
I can design a model membrane, but I cannot do it right now, because I don't have the right materials.

CO LP 10.6.6	**Support ideas/opinions using compound sentences with adverb 因此**	
For example:		
Approaching	**Attaining**	**Expanding**
我们觉得／想……，**因为** ……。 We think ……, because….	这个人……，**因此**，我们认为…… This person ……, as a result, we think……	**由于**……，**因此**，我们认为…… Due to ……, as a result we think ……

....., 因为 (because)…… 因为 (because)……, 所以 (so)……	……，因此 (as a result, therefore), ……	由于 (due to)……, 因此 (as a result, therefore), we think……
Form focus: ……，因此 (as a result, therefore), ……		
因此 (as a result, therefore) is an adverb that can be used instead of the conjunction 因为 in the second clause.		
Noticing and awareness spotlight: Use of 由于 (due to)		
由于 (due to)……, reflects a more formal register and is more likely to be used in written communication.		

CC LP 10.6.7	**State or identify what/who something is**	
For example:		
Approaching	**Attaining**	**Expanding**
她/他是工程师。	她/他像工程师。	她的角色跟工程师相似。
S/he is an engineer.	S/he is like an engineer.	Her role is similar to that of an engineer.
Pronoun (她/他) + predicate [Verb 是 + noun].	Pronoun (我们) + negation + verb (像) + noun.	Noun phrase + preposition phrase (preposition 跟+ object) + verb (相似).
Form focus		
1. Use of preposition 跟		
The preposition/coverb 跟 has several different uses. A useful sentence structure that uses this preposition is as follows: Subj./topic + preposition phrase (preposition 跟+ object) + verb + (noun phrase). 我想**跟**她／他做葡萄干实验。 I want to do the raisin experiment with her/him. Juan Daniel 和他的朋友们**跟**镇上的其他男孩子们比赛踢球。 Juan Daniel and his friends play soccer with the other boys in town.		

CC LP 10.6.8	**Express a personal opinion**	
For example:		
Approaching	**Attaining**	**Expanding**
我觉得／想 …… I feel like/think… 也许／可能 maybe, perhaps	在我看来…… It seems to me like… 对我来说，…… In my opinion, … 我认为…… I believe/think …	我建议…… I suggest… 我的看法是…… My thoughts are… 我是说…… What I mean is…

Expansion Phase--"Beyond" activities

Students will skim through the text and identify language that describes the various steps of the Engineering Design Process throughout the chapter. Then they will confirm/disconfirm predictions and brainstorm possible materials for their own model membranes.

Time: Learning Activity 7—30 minutes

Learning Activity 7

1. Ask students to find new partners. Distribute MMIC 10-5: *Juan Daniel and the Engineering Design Process*, one copy per pair. Ask students to skim through the chapter with their partner and work together to find language that can be used to answer the questions on the handout about Juan Daniel and his use of the Engineering Design Process. Instruct students to take turns writing the answers on the handout.
2. Once completed, have each pair find another pair and make a group of four. In these new groups, ask students to check and compare answers and make any changes they think are needed. Finally, call on various individual students to share their group's answer for a particular question with the whole class. Collect MMIC 10-5 as evidence of learning.
3. Look back at page 7 of MMIC 10-IWB, the whiteboard page with the class predictions of what would happen in Juan Daniel, Chapter 6, to see if they were correct. Use the whiteboard highlighter to highlight correct predictions. Ask:

中文	English
我们对第六章的预料是正确的吗?	Were our predictions for Chapter 6 correct?
我们没有预料到的是什么?	What else happened that we did not predict?

4. To close, ask students to brainstorm with their partners what materials they might use to design their own model membranes. Have the whole class share some ideas.

Language Function-Form-Vocabulary Connections (Activity 7)	
CO LP 10.7.1	**Construct characters to form words and phrases adhering to character structure rules and stroke order guidelines**

For example:
Left-right: 叫、场
Top-bottom: 吉、只
Left, middle, right: 树、谁
Top, middle, bottom: 复、常
One-part, totally enclosed: 国、回
Partially enclosed: 用，原

Approaching	**Attaining**	**Expanding**
One- and two-part characters One-part character 我、生 One-part, totally enclosed 国、回 Two-part characters Left-right: 叫、场 Top-bottom: 吉、只	**Three-part characters** Left, middle, right: 树、谁 Top, middle, bottom: 复、常 Left, top-right, bottom-right: 锋、纷 Top-left, bottom-left, right: 部、剂、劲 Left-top, right-top, bottom: 然、赞 Top, left-bottom, right-top: 死、前	**Four + part characters** Left-top, right-top, left-bottom, right bottom: 能、舒 Left, top-right, middle-right, bottom-right: 慢、镜 Left, middle, top-right, bottom-right: 游 Left, middle-top, middle-bottom, right: 湖

Form focus: Formation of Chinese characters

1. Character structure rules

Chinese characters are called "square" characters because no matter how simple or complex, each character fits inside a square. Characters can usually be divided into different parts. These parts form character structures. There are four main structures: one-part structure, two-part structure, three-part structure, and four-part structure. These structures can be further divided into sub-parts.

For example,

Two-part structures:  (top/bottom),  (left/right)

Three-part structures:  (left, top-right, bottom-right),  (top-left, bottom-left, right), etc.

2. Stroke order guidelines
General rules for writing Chinese characters are: 1. Horizontal first, then vertical. 2. Top first, then bottom. 3. Left first, then right. 4. Left-slanted first, then right-slanted. 5. Outside first, then inside. 6. Center first, then both sides. 7. With "closed" characters, enter character first, then close it up.

CO LP 10.7.2	**Use a developing understanding of basic units of word formation in Chinese to infer and construct meaning with written text**
Form focus: radical → character → compound/word	
1. radical	
A radical is the smallest meaningful orthographic unit in compound characters, for example, 虫 (insect) is used in the character 蛙 (frog). 虫 (insect) can also be a stand-alone character. There are three types of radicals: semantic (give information about character meaning) [手 (hand)], phonetic (give information about character pronunciation) [分 (fen) in the compound 纷 (one after another)], and perceptual (do not give information about character meaning or pronunciation, instead function as visual fillers) [此 (this, these in classical Chinese), however, in the compound 嘴 (mouth) the radical 此 functions as a perceptual radical providing information about neither meaning nor pronunciation].	
2. character	
A Chinese character is a meaningful orthographic unit that is always pronounced as one syllable. Chinese characters have evolved as a writing system over millennia and have developed in various ways. Some characters are **pictographs** that were originally drawings of concrete objects, for example, 雨 (rain), the four dots depicting the rain coming down from the sky; others are better described as **ideographs** because they were created as graphic representations of more abstract ideas such as the notion of "above", 上, the stroke above the horizontal line indicating the idea of "above" or "up." Another way to create characters was to combine two or more pictographs or ideographs to portray a new meaning, for example, 休 (to rest), a combination of the pictographs for person, 人, and a person leaning against a tree, 木. These types of characters are referred to as **ideogrammatic characters**. Over 90% of Chinese characters were created as **phono-semantic compound characters** and are made up of a combination of semantic and phonetic radicals. For example, 控 (to control), the semantic radical on the left side,手 (hand) , indicates that the word meaning will include an action with a hand, and the phonetic radical on the right side 空 (kōng), helps the reader with character pronunciation "kòng."	

3. compound
Compounds consist of at least two characters, neither of which is an affix, a character that on its own lacks meaning but when added to other characters becomes a meaningful unit. Most Chinese words are compounds. Compounds have various types of syntactic relationships. A few compound types: *Verb-Object:* 踢足球 (to kick soccer ball)、开球 (to kick of)、发誓 (to pledge) *Verb-Complement*: 摔倒 (to fall down)、改进 (to improve and get better)、进来 (to come in) *Subject-Predicate*: 天亮 (bright [sky is bright]) *Number-Classifier*: 各种 (various kinds)、一道 (a ray of…)、一片 (a patch of…) *Adverb-Verb*: 慢跑 (to jog [to run slowly])、快走 (to hurry [to walk fast]) *Verb-Verb-Noun*: 栖息地 (habitat [to stay and rest at a place]) *Adjective-Adjective-Noun*: 浅桃色 (light peach color)、吉祥物 (mascot [happy and auspicious object])
4. word
A word is written with one or more Chinese characters. A word can consist of a single character (脚, foot), a compound (幸运, lucky), a duplicate (招招手, to wave), or an affixed form (第一, first， 第二, second, etc.).

CO LP 10.7.3	**Ask and answer questions using question words**	
For example:		
Approaching	**Attaining**	**Expanding**
…… 吗? Use of ma …… 是不是……? Is or is not?	谁……? (Who) 什么……? (What) 哪里……? (Where) 什么时候……? (When) 怎么……? (How) 为什么……? (Why)	几/多少? (How many) 哪(些)……? (Which)
Form focus: Placement of question words		
Most question words in English occur at the beginning of a sentence. However, question words in Chinese occur in a variety of positions. Generally, question words appear in the same position as the grammatical function they serve in the sentence. For example: 谁参加足球比赛? (Who is going to play the soccer game? ["Who" occurs in subject position]) 你看见几个足球运动员? (How many soccer players did you see? ["How many" is in the # position of the noun phrase # + classifier + noun])		

Noticing and awareness spotlight: Use of 吗？ 吧？ 呢？
A few particles are commonly used at the end of questions. 吧？ is used to invite agreement. 呢？ is a tag question meaning ", and you?" 吗？ is a question particle that is used when one expects a "yes" or "no" response.

CC LP 10.7.4	**Express agreement/disagreement**	
For example:		
Approaching	**Attaining**	**Expanding**
好。 Good. 我同意。 I agree. 我也是／同意。 I also + verb (am/agree). 对。 Exactly/Correct.	你说得对。 You are correct. 你完全正确。 You're absolutely right. 我也是这么认为的。 I think so too. 我也不这么认为。 I don't think so either.	我的想法跟你的一样。 I share your thoughts. 我赞成。 I agree (more formal). 我完全赞同。 I agree with you entirely.
不。 No. 不好。 Not good。 不同意。 I don't agree with you. 不对。 Not exactly.	我不是这么认为的。 I don't think so. 是，可是你不觉得……? Yes, but don't you think… 我觉得我不同意。 I'm afraid I have to disagree。	我的意见跟你的不同。 My suggestions are different from yours. 我想和你讨论讨论…… I must take issue with you on that. 然而 However
Noticing and awareness spotlight: Repetition of verb		
Repetition of a verb, e.g., 讨论讨论 (to discuss), can be used to soften the tone of voice.		

Adaptation of EiE® story *Juan Daniel's Fútbol Frog*, Chapter 6

CC LP 10.7.5	**Negotiate turn-taking**	
Approaching	**Attaining**	**Expanding**
该我了! My turn! 到你了! Your turn! 下一个是谁? Who’s next? 下一个是你吗? Are you the next one?	下一个该轮到谁了? Who is the next? 我觉得该你了。 I think it’s your turn. 大家都在等你呢! All of us are waiting for you!	如果你不赶紧，我们都不能往下进行。 If you don’t hurry, none of us can move on to the next.

Evidence of learning

- Completed handouts:
  - MMIC 10-2: *Chapter 5 Summary Paragraph*
  - MMIC 10-4: *Chapter 6 Paragraph on the Engineering Design Process*
  - MMIC 10-5: *Juan Daniel and the Engineering Design Process*
- Oral contributions to the “Scientists/Engineers” Compare-contrast chart discussion
- Oral answers to *Juan Daniel,* Chapter 6 comprehension questions
- Oral contributions to brainstorming of possible materials for model membranes
- Informal observation of cross-cultural chart discussion

Vocabulary List

Content-obligatory (CO)

了解 Recognize			
Pīnyīn	**Characters**	**English meaning**	**Parts of speech**
bái tóu yīng	白头鹰	bald eagle	noun
biàn chòu	变臭	turn smelly (smelly water)	verb
bú shì zhēnzhèng de	不是真正的	unreal	verbal phrase
bù zhòu	步骤	step	noun
chōng le gè zǎo	冲了个澡	to sprinkle	verb
dà hóng shuǐ	大洪水	flood	noun
dǎ shuǐ	打水	to fetch water (from well)	verb
dān dǐng hè	丹顶鹤	red-crowned crane	noun
dòng shǒu zuò	动手做	create	verbal phrase
gǎi jìn	改进	improve	verbal phrase
gōng chéng shè jì bù zhòu	工程设计步骤	Engineering Design Process	noun
hǎi xǐ què	海喜鹊	motmot	noun
hú lú	葫芦	tecomate	noun
jiàn zhù shī	建筑师	architect	noun
jié yuē/jié shěng	节约／节省	save	verb
jǐng	井	well	noun
lǐ wù	礼物	gift	noun
mó xíng	模型	to model/modeling	verb
mù jiàng	木匠	carpenter	noun
qù jiě jué shí jì wèn tí	去解决实际问题	to solve real-world problems	verbal phrase
quē fá	缺乏	scarcity	verb
shè jì	设计	to design	verb
shè jì	设计	plan	verbal phrase
sī kǎo	思考	imagine	verbal phrase
sòng xíng/sòng bié/zèng bié	送行／送别／赠别	send-off	verb
tí wèn	提问	ask	verbal phrase
yōng bào	拥抱	hug	verb
zhé liǔ	折柳	bend the willow	verb
zhēnzhèng de	真正的	real	adjective

识记 Produce			
Pīnyīn	**Characters**	**English meaning**	**Parts of speech**
bǎo hù	保护	to protect	verb
bó	薄	thin	adjective
cè shì	测试	test hypothesis	verb
cè shì	测试	to test	verb
chuān guò/tōng guò	穿过／通过	pass through	verb
fēn xī	分析	analyze results	verb
gào bié	告别	leave-taking	noun/verb
gōng chéng shī	工程师	engineer	noun
guān chá	观察	observe	verb/noun
hòu	厚	thick	adjective
huì bào	汇报	report results	verb
jiǎ shè	假设	make hypothesis	verb
jié lùn	结论	draw conclusions	verb
kē xué jiā	科学家	scientist	noun
shēng wù gōng chéng shī	生物工程师	bioengineer	noun
shí yàn	实验	experiment	verb/noun
sòng lǐ	送礼	gift-giving	noun/verb
tè zhēng	特征	properties	noun
tí wèn	提问	ask questions	verb
xī shōu	吸收	absorb	verb/noun
yǒu dòng	有洞	has holes	verb
yǒu xiǎo kǒng	有小孔	has small holes	verb
zǔ dǎng	阻挡	block	verb
zǔ dǎng huī chén	阻挡灰尘	blocks dirt/keeps dirt out	verb

Content-compatible (CC)

了解 Recognize			
Pīnyīn	**Characters**	**English meaning**	**Parts of speech**
cháo shī	潮湿	moist	adjective
gǔ de	鼓的	plump	adjective
guó niǎo	国鸟	national bird	noun
hǎi xǐ què	海喜鹊	motmot	noun
hú zhuàng de	糊状的	squishy	adjective
huǒ bàn	伙伴	partner	noun

lǜ sè de yóu guāng fā liàng de	绿色的油光发亮的	waxy green leaf	adjective phrase
pù bù	瀑布	water fall	noun
quán bān	全班	whole class	noun
shù guān céng	树冠层	leafy layer	noun
xì de	细的	slimy	adjective
xiǎo zǔ	小组	small group	noun
yī dī shuǐ	一滴水	drop of water	noun
yí piàn lǜ sè de yè zi	一片绿色的叶子	a green leaf	noun phrase
zhì dì	质地	texture	noun
zhòu zhé de	皱褶的	wrinkle	adjective
识记 Produce			
Pīnyīn	**Characters**	**English meaning**	**Parts of speech**
bǐ jiào	比较	to compare/contrast	verb
cái liào guǎn lǐ yuán	材料管理员	Magnificent Materials Manager	noun
chǎng jǐng	场景	setting	noun
cū cāo de	粗糙的	rough	adjective
dà de	大的	big	adjective
dà xiǎo	大小	size	noun
dī	滴	drip	measure word
gān de	干的	dry	adjective
gòng tóng diǎn	共同点	in common	noun
gōng zuò guǎn lǐ yuán	工作管理员	Terrific Taskmaster	noun
hè sè de	褐色的	brown	adjective
hēi hè sè de	黑褐色的	black	adjective
huá gài	华盖	canopy	noun
jì lù yuán	记录员	Remarkable Recorder	noun
jié jú	结局	solution	noun
píng huá de	平滑的	smooth	adjective
pù bù	瀑布	water fall	noun
qiǎn hè sè de	浅褐色的	light brown	adjective
rè dài yǔ lín	热带雨林	rain forest	noun
rén wù	人物	characters	noun
rén wù	人物	characters	noun
rì zhì	日志	journal	noun
shēn hè sè de	深褐色的	dark brown	adjective

shī de	湿的	wet	adjective
shī hu hu de	湿乎乎的	moist	adjective
shì jiàn	事件	events	noun
tuī cè	推测	to predict/prediction	verb/noun
wèn tí	问题	problem	noun
xì jié	细节	details	noun
xiǎo de	小的	small	adjective
xíng zhuàng	形状	shape	noun
yán sè	颜色	color	noun
yǎn shì zhì jiǎn yuán	演示质检员	Polished Presenter	noun
yìng de	硬的	hard	adjective
yuán de	圆的	round	adjective
zhāng jié	章节	chapter	noun
zhào piàn	照片	photo	noun
zhì dì	质地	texture	noun
zhōng děng de	中等的	average/medium	adjective
zhōng wén dū chá yuán	中文督察员	Chinese Champion	noun
zhǔ tǐ sī xiǎng	主体思想	main idea	noun
zhǔ yào rén wù	主要人物	main character	noun
zǐ sè de	紫色的	purple	adjective

科学方法的五个步骤

说明： 沿线将下面的纸条剪开，并放在一个牛皮纸袋里。

第一步: 提出假设
第二步: 验证假设
第三步: 分析结果
第四步: 得出结论
第五步: 汇报结论

The Five Steps of the Scientific Method
Directions: Cut out and place strips in a small brown bag.

Step 1: Make hypothesis
Step 2: Test hypothesis
Step 3: Analyze results
Step 4: Draw conclusions
Step 5: Report conclusions

科学方法

一些例子

葡萄干的表皮: 是天然的薄膜吗?

图片	科学方法	葡萄干实验
图片#1	第一步 提出假设	葡萄干在水里膨胀，是因为葡萄干的表皮是一种薄膜，它可以让水通过。
图片#2	第二步 验证假设	我们把葡萄干分不同时间浸入水中。
图片#3	第三步 分析结果	我们观察和比较这些不同时间浸入的葡萄干，观察它们在大小和质地上的区别。
图片#4	第四步 得出结论	像青蛙的皮肤一样，葡萄干的表皮是一种薄膜，上面有许多看不见的小洞洞可以让水流过。
图片#5	第五步 汇报结论	我们在 MMIC 9-6 (EiE® {3-1})中汇报我们的结论：薄膜探索—葡萄干。我们也在科学期刊上公布了我们的结论。

The Scientific Method

Sample Completed Table

Raisin Skin: A Natural Membrane?

Photos	Scientific Method	Raisin Experiment
Photo #1	Step 1. Make hypothesis	Raisins will expand in water because raisin skin is a membrane that allows water to pass through it.
Photo #2	Step 2. Test hypothesis	We soaked raisins in water for different amounts of time.
Photo #3	Step 3. Analyze results	We made observations and then compared and contrasted the size and texture of the raisins we soaked.
Photo #4	Step 4. Draw conclusions	Raisin skin, like frog skin, is a membrane. It has holes that are too small to see and allows some things like water to pass through the holes.
Photo #5	Step 5. Report conclusions	We reported our conclusions on MMIC 9-6 (EiE® {3-1}): *Exploring Membranes: Raisin Skin.* We also reported conclusions in our science journals.

日期_____

姓名 _____

姓名 _____

第五章段落大意

说明: 请一起完成下列的段落大意，下列词语至少使用一次!

热带雨林	树冠层	瀑布	滴水
设计	湿润	海喜鹊	

在第五章，Juan Daniel 去了_____。他看见了

_____， _____ 和 _____。

Juan Daniel 到这里来回答如何保持青娃_____

的问题。在仔细的观察后，他得到的解决方法是：他需要 _____

_____才能保证足够的水份。

Date:_____

Names: _____ _____

Chapter 5 Summary Paragraph

Directions: Work together to complete the following summary paragraph of Chapter 5. Be sure to use each of the following words at least once!

rain forest canopy waterfall drip design moist motmot

In Chapter 5, Juan Daniel went to the _____.

He saw a _____, a _____, and

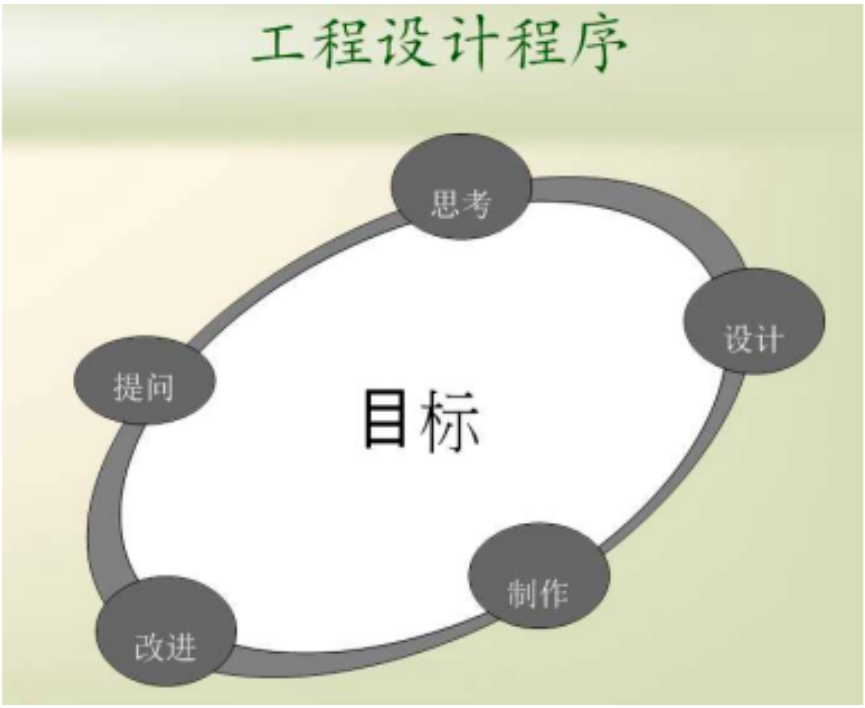
a _____. Juan Daniel came here to answer a question about how

to keep his frog _____. By careful observation he got an answer

to his question: He needed to _____ something to

_____ just enough water!

姓名:_____ 日期:_____



提问: 问题是什么?
别人都做了些什么?
有什么局限?

思考: 可能的解决方法是什么?
即兴的想法
选出最好的

设计: 画一张图表
列出你所需要的东西

制作: 按你的计划来做
测试一下!

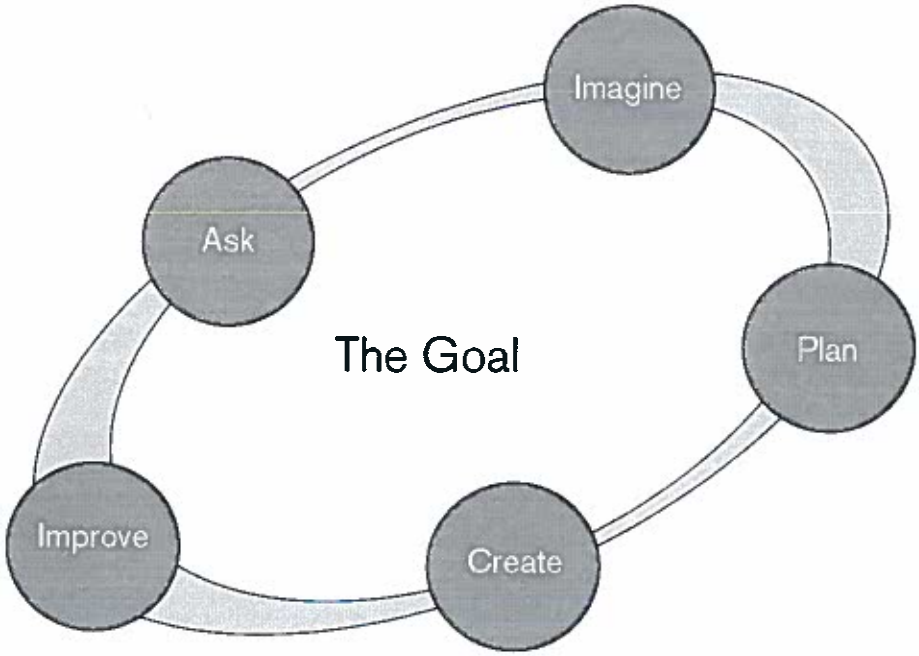
改进: 完善最初的设计
测试一下!

Name: _____ Date: _____

A

B

The Engineering Design Process: Five Steps for Engineering Design



Ask: What's the problem?
What have others done?
What are the constraints?

Imagine: What could be some solutions?
Brainstorm ideas.
Choose the best one.

Plan: Draw a diagram.
Make a list of materials you'll need.

Create: Follow your plan and create it.
Test it out!

Improve: Make your design even better.
Test it out!

日期: _____

姓名: _____

姓名: _____

说明: 请一起阅读下面从第六章中选取的段落。一边读一边寻找工程设计程序的五个步骤。然后在表格中“找字”一栏中写下和步骤配对的文字，可以用几个关键字记录就好。然后在“画图”栏中用画图或图画的方式表现这个步骤。

“我工作的时候常常采用一些步骤。这些步骤叫做‘工程设计程序’。我觉得它们很有用。你也可以试试看。也许它们对你会有帮助。工程设计程序有五个步骤。第一步叫提问。你要问问题，搞清楚解决什么问题。第二步是思考。想一想有哪些可能的解决办法。我觉得你已经在思考了。第三步是设计。用什么材料？写一个计划。第四步是制作。动手把它做出来。第五步是改进。想想看有没有需要修改的地方。”

--Peters 女士，《Juan Daniel 的幸运蛙》，p. 41

工程设计程序

	找字	画图
第一步		
第二步		
第三步		
第四步		
第五步		

Names: _____ _____ Date:_____

Directions: Read the following excerpt from Chapter 6 of the Juan Daniel story together. As you read the text, look for each of the five steps of the engineering design process. Write each step down in the "Find the Words" column below. Use one key word or a phrase. Then draw a picture or a symbol in the "Draw a Picture" column to help you recall each step.

"Maybe you'll want to use the steps that I find helpful in my work. They're called the engineering design process. First you ask some good questions and imagine lots of possible solutions, just like you've started to do already. Then you think about what materials you could use, make a plan, and create your design. Finally, you see if there's any way to improve it."

--Ms. Peters, *Juan Daniel's Fútbol Frog* (page 30)

The Engineering Design Process

	Find the Words	Draw a Picture
Step One:		
Step Two:		
Step Three:		
Step Four:		
Step Five:		

姓名: _____ 日期: _____

Juan Daniel 和工程设计程序

提问	Juan Daniel 的工程问题是什么?
思考	Juan Daniel 在想方法的时候做了什么?
设计	Juan Daniel 在设计的时候做了什么?
制作	Juan Daniel 在设计模型的时候做了什么?
改进	Juan Daniel 在改进薄膜模型的时候做了什么?

Name: _____ Date:_____

Juan Daniel and the Engineering Design Process (EDP)

ASK	**What is Juan Daniel’s engineering question?**
IMAGINE	**What does Juan Daniel do to help him imagine?**
PLAN	**What does Juan Daniel do as he plans the model?**
DESIGN	**What does Juan Daniel do to design his model?**
IMPROVE	**What kinds of things does Juan Daniel do to improve his model?**

葡萄干的表皮：天然的薄膜？

Teacher: Insert necessary photos of students here.

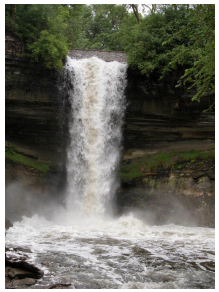
葡萄干的表皮：天然的薄膜？

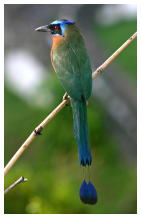
材料管理员	**管理**纸和演示的材料
演示质检员	**向全班演示你**们小组的步骤
记录员	记录你们小组的步骤
中文督察员	**用各种**资料帮助你们小组在活动的过程中说**中文，并且提示中文字**、词
工作管理员	**分配任**务和管理时间

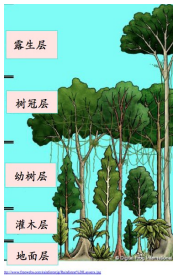
葡萄干的表皮：天然的薄膜？

Teacher: Insert necessary photos of students here.

图片	**科学方法**	**葡萄干**实验
图片#1	**第一步**	
图片#2	**第二步**	
图片#3	**第三步**	
图片#4	**第四步**	
图片#5	**第五步**	

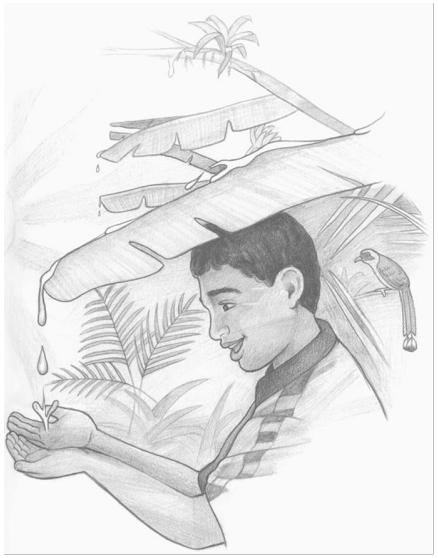






蜡质叶面　　树冠层　　国鸟：海喜鹊

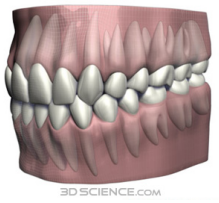
瀑布　　水滴



Teacher: Insert page 21 of MMIC 8-IWB

谁?	**科学家**	**工程**师
他们做什么?		
为什么?		
他们用什么方法工作?		
他们的方法有什么步骤?		

模型是什么？



阅读理解

为什么 Juan Daniel想把青蛙留在身边更久一点？

Juan Daniel要解决什么问题？

Juan Daniel想出了什么方法来帮助青蛙？

为什么设计薄膜模型的重点在于让水一点一滴地流下来？

Peters女士是如何帮助 Juan Daniel解决问题的？

为什么 Juan Daniel送葫芦给 Peters女士？他希望这份礼物会什么作用？

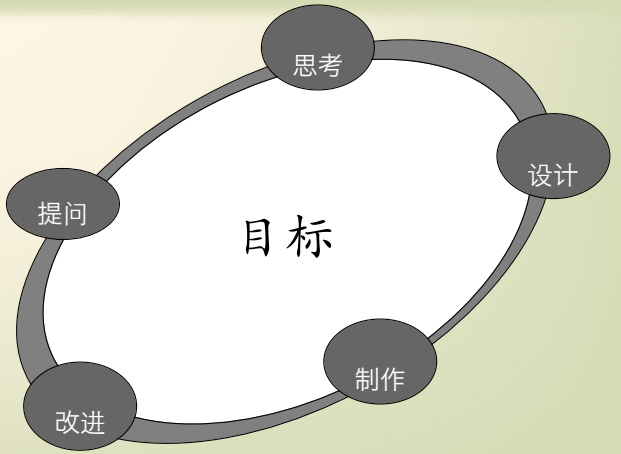
制作薄膜模型的时候， Juan Daniel和 Marcela都做了什么？

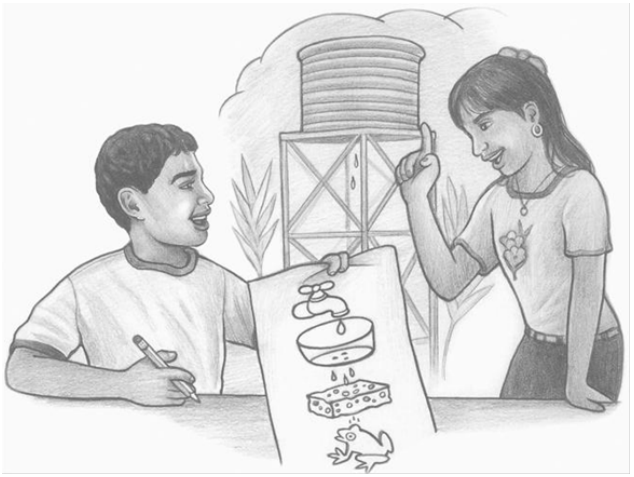
工程设计程序

	找字	画图
第一步		
第二步		
第三步		
第四步		
第五步		

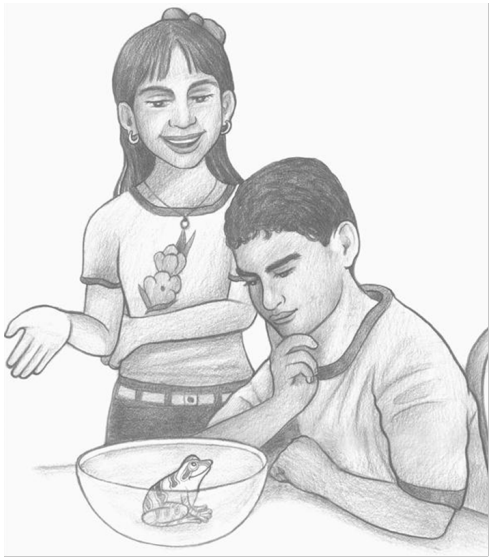
1-6

Juan Daniel 和工程设计程序





葫芦 Tecomate



现在我要想一想怎么设计它！