# Unit 1 The Design Process

How do you solve problems?

## Lesson Plan

| Unit Opener & Lesson 1 What is technology? | | | |
|---|---|---|---|
| | **Activity** | **Pages** | **Time** |
| **Engage** | • Unit Opener: Think! *What are the father and son in the picture making?* | SB p. 4 | 15 min |
| | • Unit Opener: Identify tools. | SB p. 4 | 15 min |
| | • Unit Opener: Determine an object to be made and the tools needed. | SB p. 4 | 15 min |
| | • Think! *What would you like to invent?* | SB p. 6 | 10 min |
| | • Think! *What technology helps us in our classroom?* | TB p. 7 | 10 min |
| **Explore** | • Digital Lab: *Which tool works better?* (ActiveTeach) | TB p. 5 | 30 min |
| **Explain** | • Technology | SB p. 5 | 30 min |
| | • Solve problems | SB p. 6 | 30 min |
| | • Staying safe | SB p. 7 | 30 min |
| | • *Got it? 60-Second Video* (ActiveTeach) | TB p. 7 | 15 min |
| **Elaborate** | • Science Notebook: My Favorite Technology | TB p. 5 | 40 min |
| | • Technology Mural | TB p. 6 | 40 min |
| **Evaluate** | • *Lesson 1 Check* (ActiveTeach) | TB p. 15a | 20 min |
| | • Assessment for Learning | TB p. 7 | 15 min |
| | • Review (Lesson 1) | SB p 15 | 25 min |
| | • *Got it? Self Assessment* (ActiveTeach) | TB p. 15b | 15 min |
| | • *Got it? Quiz* (ActiveTeach) | TB p. 15c | 15 min |

| Lesson 2 What are objects made of? | | | |
|---|---|---|---|
| | **Activity** | **Pages** | **Time** |
| **Engage** | • Think! *How is a natural material different from one made by people?* | TB p. 8 | 10 min |
| | • Think! *What classroom objects are made of man-made materials? Which ones are made with natural materials?* | TB p. 9 | 10 min |
| | • Think! *Is metal a natural or a man-made material?* | TB p. 10 | 10 min |
| **Explore** | • Digital Activity: *Invention: Orville Redenbacher* (ActiveTeach) | TB p. 8 | 20 min |
| **Explain** | • Different materials | SB p. 8 | 30 min |
| | • Natural materials | SB p. 9 | 30 min |
| | • Man-Made materials | SB p. 10 | 30 min |
| | • *Got it? 60-Second Video* (ActiveTeach) | TB p. 10 | 15 min |
| **Elaborate** | • Science Notebook: Natural Materials | TB p. 9 | 40 min |
| | • What Things Are Made Of Chart | TB p. 10 | 40 min |
| **Evaluate** | • *Lesson 2 Check* (ActiveTeach) | TB p. 15a | 20 min |
| | • Assessment for Learning | TB p. 10 | 15 min |
| | • Review (Lesson 2) | SB p. 15 | 25 min |
| | • *Got it? Self Assessment* (ActiveTeach) | TB p. 15b | 15 min |
| | • *Got it? Quiz* (ActiveTeach) | TB p. 15c | 15 min |

| Lesson 3 What is the design process? | | | |
|---|---|---|---|
| | **Activity** | **Pages** | **Time** |
| **Engage** | • Think! *Why do people have to help wood ducks?*<br>• Think! *What safety rules do you have to follow when you build a wood duck house?*<br>• Think! *What can you do if your wood duck house does not work?* | TB p. 11<br>TB p. 12<br>TB p. 13 | 10 min<br>10 min<br>10 min |
| **Explore** | • Digital Lab: *Which design works best?* (ActiveTeach) | TB p. 11 | 30 min |
| **Explain** | • A problem and a goal<br>• Plan and draw<br>• Choose materials<br>• Make a test<br>• Record and share<br>• *Got it? 60-Second Video* (ActiveTeach) | SB p. 11<br>SB p. 11<br>SB p. 12<br>SB p. 13<br>SB p. 13<br>TB p. 13 | 30 min<br>30 min<br>30 min<br>30 min<br>30 min<br>15 min |
| **Elaborate** | • Goals Collage<br>• Science Notebook: Make a Plan | TB p. 11<br>TB p. 12 | 40 min<br>40 min |
| **Evaluate** | • *Lesson 3 Check* (ActiveTeach)<br>• Assessment for Learning<br>• Review Lesson 3<br>• *Got it? Self Assessment* (ActiveTeach)<br>• *Got it? Quiz* (ActiveTeach) | TB p. 15a<br>TB p. 13<br>SB p.15<br>TB p. 15b<br>TB p. 15c | 20 min<br>15 min<br>25 min<br>15 min<br>15 min |
| **Lab** | • *Let's Investigate! How can you build a boat?* (ActiveTeach) | TB p. 14 | 30 min |

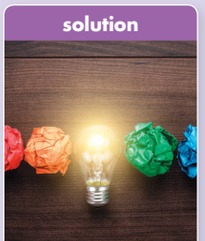
# Flash Cards

**technology**

**natural**

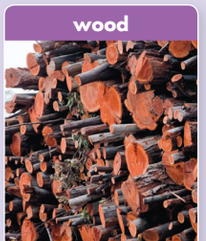
**goal**

**solution**



**man-made**

**wood**



**cotton**

**rock**

**plastic**

| Lesson 1 | |
|---|---|
| **Key Words** | **ELL Support** |
| *technology, science, scientist, discovery* | **Questions with *what*:** *What are they making? What tools are they using?*<br>**Simple Present:** *Scientists use technology to make discoveries. Technology helps scientists do their work.*<br>**Vocabulary:** *solve, tool, stapler, nails, hammer, screwdriver, scissors, make, bicycle, telephone, computer, cell phone, invention, communicate* |

| Lesson 2 | |
|---|---|
| **Key Words** | **ELL Support** |
| *materials, natural, wood, cotton, rock, plastic* | **Vocabulary:** *object, Earth, mineral, hard, soft, clothes, man-made, plastic cup, packing foam* |

| Lesson 3 | |
|---|---|
| **Key Words** | **ELL Support** |
| *goal, solution, problem, plan, label* | **Sequence Words:** *first, next, then, last*<br>**Vocabulary:** *shelter, design, wood duck, build, house, wall, tape, screen, test, record, share, nail, hole* |

# Unit 1 The Design Process

## Unit Objectives

**Lesson 1:** Students will identify how technology can help people solve problems.

**Lesson 2:** Students will explain what materials some objects are made of.

**Lesson 3:** Students will describe the design process and explain how to use it to find a solution.

**Vocabulary:** *solve, problem, tool, stapler, nails, hammer, screwdriver, scissors, make*

## Introduce the Big Question

**How do you solve problems?**

**Build Background** *Imagine you want to drink milk from a very full glass. How can you drink the milk without spilling it?* Hold up a straw. Have students identify it. *A straw is a tool that can help you solve your problem. You can use it to drink the milk from the glass without spilling!*

### Engage

### Think!

*What are the father and son in this picture making?*

*Look at the picture of the boy and his father. What tools are they using?* Elicit *hammer* and *nails*. Point to the birdhouse. *What do you think this is for?* Accept all logical answers. Provide language support if needed. Next, explain to students that building requires materials, tools, and thinking. Have them look closely at the photograph, paying special attention to the tools they see.

1 **Look and circle the tools they are using.**

Have students circle the tools the father and his son are using. Use the pictures to elicit vocabulary and teach new words.

2 **Think of something you want to make. Name the tools you will need.**

Encourage students to think of something they want to make. Next, invite volunteers to name the tools they will need. Write the tools in a list on the board. Read the list along with the class. Invite volunteers to the board to make sketches of the tools written on the board. Provide assistance as needed.


## ELL Language Support

Point out and practice questions with *what*. Ask students to identify which verb follows the question word (to be).

- *What are they making?*
- *What tools are they using?*
- *What is the house for?*

### Think! Again!

Revisit the question *What are the father and son making?* (Possible answer: *They are making a bird house.*)

Lesson 1

# What is technology?

**Objective:** Learn how technology helps people solve problems.

**Vocabulary:** *technology, science, scientist, discovery, bicycle, telephone, computer, tablet, cell phone, invention, forceps*

**Digital Resources:** Flash Card (*technology*), *Let's Explore!* Digital Lab

**Materials:** picture of a microwave oven, gram cube

## Unlock the Big Question

Write the following text on the board: *I will learn how technology helps people solve problems.*

**Build Background** Hold up the picture of a microwave oven and the *technology* Flash Card. Explain that the microwave oven is a kind of technology people use in their homes to heat and cook food. *The oven is a kind of technology that helps people solve problems and get jobs done.* Elicit other kinds of technology people use at home. (Possible answers: *vacuum cleaners, can openers, washing machines, computers,* and so on)

## Explore

**Let's Explore! Lab** **Which tool works better?**

**Objective:** Determine which tool works better to pick up a gram cube.

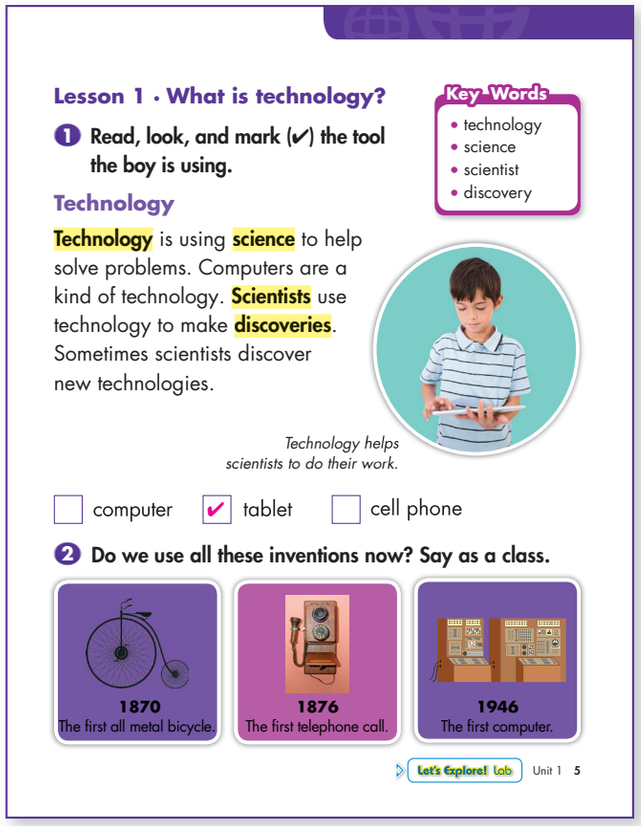
**Digital Resources:** *Let's Explore!* Digital Lab, *Let's Explore! Activity Card* (1 per student) (*Optional*: Do the lab in class; refer to the *Activity Card* for materials and steps.)

- Put a gram cube on a table. *I want to pick this gram cube up using a tool.* Have students brainstorm tools you can use. Write students' ideas on the board.
- *We will watch a video to find out which tool works better to pick up a gram cube—forceps or two pencils.*
- Show the Digital Lab. Check students' comprehension. *Are forceps a tool? Are pencils tools? Can forceps and pencils help solve the problem of picking up a gram cube?*
- Show the Digital Lab again. *Which tool worked better to pick up the gram cube?* (Answer: *The forceps.*)
- Have students complete the *Activity Card.*

## Explain

**1 Read, look, and mark (✓) the tool the boy is using.**

Invite volunteers to come to the board and draw a computer, a tablet, and a cell phone. Label each picture. Then point to each drawing and have the class read the words aloud. Explain that they are all examples of technology. Next, have students read the text along with you. Finally, have students look at the picture of the boy. Ask them to mark the word that shows the kind of technology he is using.




### ELL Language Support

Review the simple present. Write the following sentences on the board:
1. *Technology helps scientists.*
2. *Scientists use technology.*

Remind students to add an *–s* to the verbs in the sentences with the third person singular. Write the sentences on the board and invite the class to read them along with you.

**2 Do we use all these inventions now? Say as a class.**

Have students look at the photos of the first bicycle, telephone, and computer. Encourage the class to say if we still use these inventions now.

## Elaborate

**Science Notebook: My Favorite Technology**

Have students draw a picture of their favorite kind of technology in their Science Notebooks. Have students label their drawings.

Lesson 1

# What is technology?

**Objective:** Learn how technology helps people solve problems.

**Vocabulary:** *communicate, telephone, technology, computer*

**Digital Resources:** *I Will Know...* Digital Activity

**Materials:** old magazines with pictures related to technology (1 per group), scissors (1 per child), glue, 1 large sheet of white paper, tape, marker

**Build Background** Mime riding a bicycle and have students guess what you are doing. *What am I doing?* (Answer: *You're riding a bicycle.*) Remind students that, long ago, the bicycle was a new technology that helped people travel faster than walking from place to place. *What are other technologies that help people travel faster today?* (Possible answers: *plane, car, train,* and so on)

## Explain

**3 Read and underline a problem that technology solves.**

Have students look at the picture of the boy. *What is the boy doing?* (Answer: *He is writing.*) *What is he using?* (Answer: *A pencil.*) *Is a pencil a kind of technology?* (Answer: *Yes.*) Have students read the text along with you. Then ask them to underline a problem that technology solves. Ask comprehension questions:

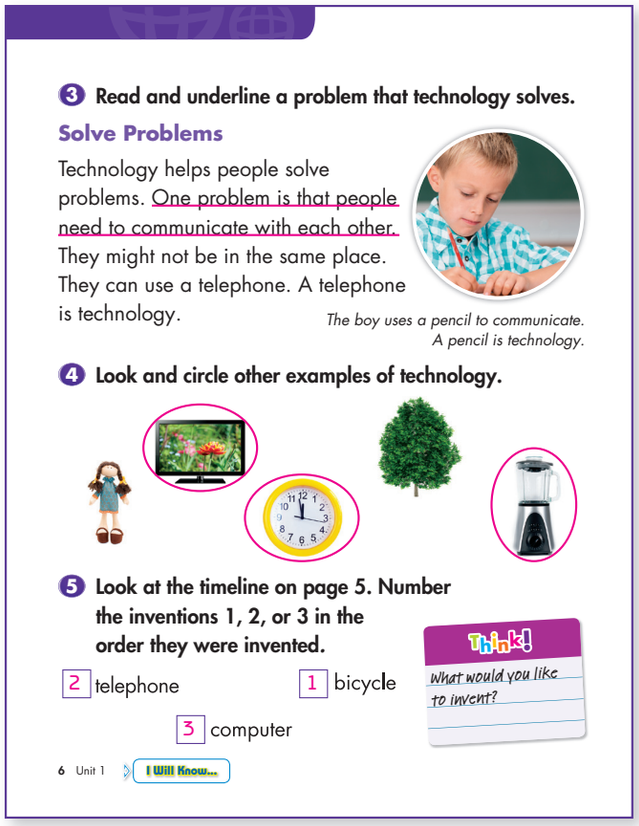
- *What does technology do?* (Answer: *Solve problems.*)
- *What is one problem people have?* (Answer: *They need to communicate with one another.*)
- *What technology can solve that problem?* (Answer: *A telephone.*)

**4 Look and circle other examples of technology.**

Ask students to look at the pictures and circle the ones that depict technology.

**5 Look at the timeline on page 5. Number the inventions 1, 2, or 3 in the order they were invented.**

Have students look at the pictures of the inventions on page 5. Then invite them to number *telephone*, *computer*, and *bicycle* 1, 2, or 3 in the order in which they were invented.



3 Read and underline a problem that technology solves.

Solve Problems

Technology helps people solve problems. One problem is that people need to communicate with each other. They might not be in the same place. They can use a telephone. A telephone is technology.

*The boy uses a pencil to communicate. A pencil is technology.*

4 Look and circle other examples of technology.

5 Look at the timeline on page 5. Number the inventions 1, 2, or 3 in the order they were invented.

2 telephone 1 bicycle 3 computer

Think! What would you like to invent?

6 Unit 1 I Will Know...

## Elaborate

### Technology Mural

Divide the class into five groups. Distribute magazines. Have students flip through the magazines and look for pictures of technology. Invite groups to come up and share their findings with the rest of the class. Encourage groups to say what technologies they found and how people use them to solve problems. Provide language support as needed. Next, have students cut out the pictures they found and glue them on a large sheet of white paper to make a mural. Write the following heading on the mural: *Technology Helps Solve Problems.* Attach the mural to a classroom wall.

## Think!

On the board, write *What would you like to invent?* Invite volunteers to come up and answer the question. Accept all logical answers and provide language support if needed.

### I Will Know...

Have students do the *I Will Know...* Digital Activity.

Lesson 1

# What is technology?

**Objective:** Learn how technology helps people stay safe.

**Vocabulary:** *safe, car, seat belt, airbag, safety seat*

**Digital Resources:** *Lesson 1 Check* (print out 1 per student), *Got it? 60-Second Video*

**Materials:** pictures of a telephone, a computer, and a car, pictures of some technology items and pictures of some non-technology items

**Build Background** Display the pictures of a telephone, a computer, and a car. *Which technology probably helps the most people: the telephone, the computer, or the car?* (Possible answer: *The telephone probably helps the most people. Not everyone has a car or a computer, but most people have a telephone.*)

## Explain

**6** **Read. What are three kinds of technology a car can have? Say with a partner.**

Have students look at the picture of the boys in the car. Ask them to read the text along with you. Next, pair students and encourage them to say three kinds of technology a car can have. (Possible answers: *seat belts, airbags,* and *safety seats*)

**ELL Content Support**

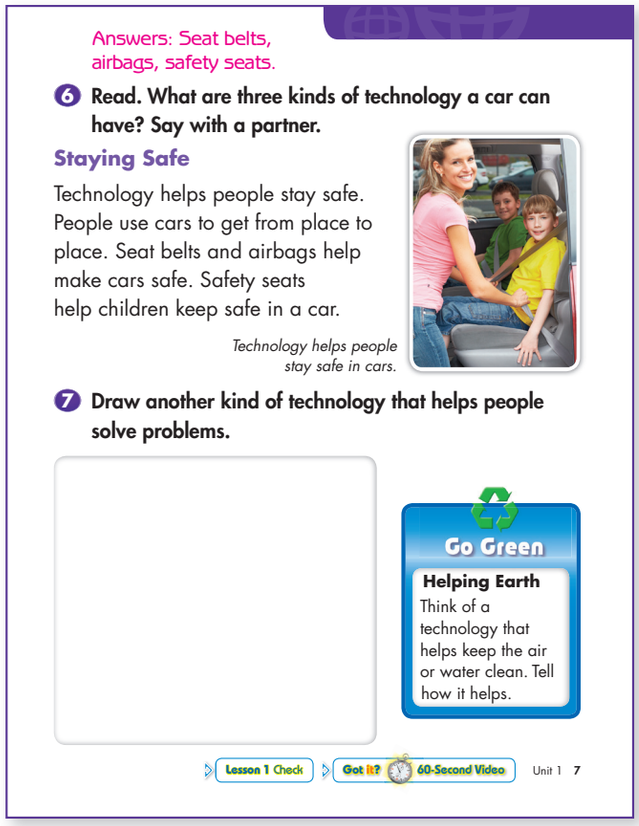
Show pictures of different items and have students say if they are kinds of technology or not.

**7** **Draw another kind of technology that helps people solve problems.**

Have students think of a kind of technology that helps people solve problems and draw it in the space provided. Invite volunteers to share their drawings with the rest of the class.

## Think!

Write the following question on the board: *What technology helps us in our classroom?* Accept all logical answers.



Answers: Seat belts, airbags, safety seats.

**6** **Read. What are three kinds of technology a car can have? Say with a partner.**

**Staying Safe**

Technology helps people stay safe. People use cars to get from place to place. Seat belts and airbags help make cars safe. Safety seats help children keep safe in a car.

*Technology helps people stay safe in cars.*

**7** **Draw another kind of technology that helps people solve problems.**

**Go Green**

**Helping Earth**

Think of a technology that helps keep the air or water clean. Tell how it helps.

Lesson 1 Check | Got it? 60-Second Video | Unit 1 7

## Evaluate

**Lesson 1 Check** **Assessment for Learning**

Distribute the *Lesson 1 Check* and guide students as they complete it. Check answers as a class. Then ask students to grade their progress on the topic of technology from 1 to 3: 3 = *I understand what technology is*; 2 = *I need to study more*; 1 = *I need help!* Encourage students giving themselves a 1 or a 2 to say what they found difficult and what they need to study more.

**Got it? 60-Second Video**

Review Key Words for Lesson 1 (see Student's Book page 5). Play the *Got it? 60-Second Video* to review the lesson material.

Lesson 2

# What are objects made of?

**Objective:** Learn what objects are made of.

**Vocabulary:** *object, Earth, mineral*

**Digital Resources:** *Explore My Planet!* Digital Activity, Flash Cards (*natural, man-made*)

## Unlock the Big Question

Write the following text on the board: *I will learn what materials different objects are made of.*

**Build Background** Display the *natural* Flash Card. Point to the fruits. *Apples are natural. They grow on trees, and we can eat them. We can find them in nature.* Next, display the *man-made* Flash Card. *Look at this bottle. It is not natural. People made it. It is a man-made object.*

Then take students to the playground. Encourage them to look for natural and man-made objects.

## Explore

**Explore My Planet! Invention: Orville Redenbacher**

**Objective:** Students will learn that people can not only invent things and test how well they work, but they can also can test things found in nature, such as crops, and can think of ways to make them better.

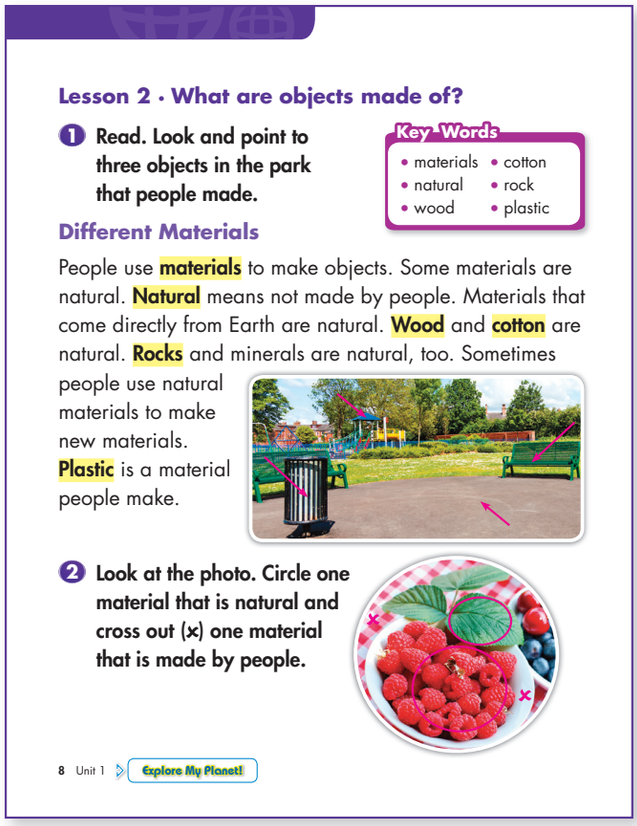
**Digital Resources:** *Explore My Planet!* Digital Activity, *Explore My Planet! Activity Card* (1 per student)

- Show the *Explore My Planet!* Check students' comprehension. *Do you like to eat popcorn?* (Answers will vary.) *What did Orville Redenbacher want to find?* (Answer: *The kind of corn that makes the best popcorn.*) *What did he grow?* (Answer: *Many different kinds of corn.*) *Did he find corn that made good popcorn?* (Answer: *Yes.*)
- Have students complete the *Activity Card.*

## Explain

**1 Read. Look and point to three objects in the park that people made.**

Have students read the text along with you. Have them look at the picture of the park and identify three man-made objects. Check answers as a class.



**Lesson 2 · What are objects made of?**

**1 Read. Look and point to three objects in the park that people made.**

Key Words
- materials
- natural
- wood
- cotton
- rock
- plastic

**Different Materials**

People use **materials** to make objects. Some materials are natural. **Natural** means not made by people. Materials that come directly from Earth are natural. **Wood** and **cotton** are natural. **Rocks** and minerals are natural, too. Sometimes people use natural materials to make new materials. **Plastic** is a material people make.

**2 Look at the photo. Circle one material that is natural and cross out (x) one material that is made by people.**

8 Unit 1 Explore My Planet!

**2 Look at the photo. Circle one material that is natural and cross out (x) one material that is made by people.**

Have students look at the photo and identify natural and man-made materials. Check answers as a class.

### ELL Content Support

Divide the class into two teams. Ask a student on team A to name a natural thing. Write it on the board. Then ask a student on team B to name a man-made thing. Write it on the board. Read the lists of natural and man-made things along with the students.

## Think!

Write the following question on the board: *How is a natural material different from one made by people?* Invite volunteers to answer. (Possible answer: *Man-made materials are made by people. Natural materials come from Earth.*)

Lesson 2

# What are objects made of?

**Objective:** Identify different kinds of natural materials.

**Vocabulary:** *hard, soft, clothes*

**Digital Resources:** Flash Cards (*cotton, rock, wood*), *I Will Know…* Digital Activity

**Materials:** teddy bear, pillow

## ELL Vocabulary Support

Hold up a teddy bear. *This teddy bear is soft.* Then knock on the door. *The door is hard.* Write the words *soft* and *hard* on the board. Have students read them along with you. Next, elicit examples of soft and hard things. Next, display the *cotton*, *rock*, and *wood* Flash Cards and introduce the new vocabulary.

## Explain

**3 Read. Look and color the frame around the materials you might use to build a house.**

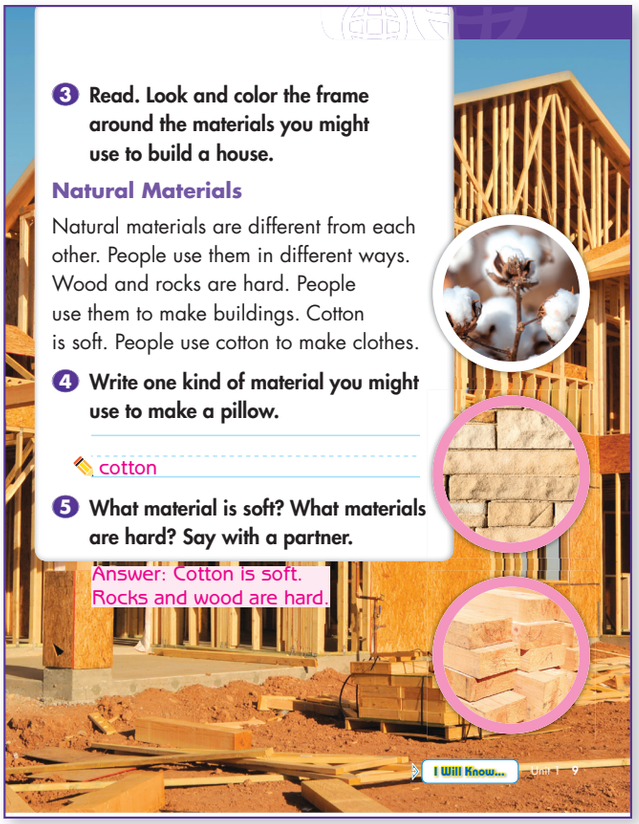
Have students read the text along with you. Have them identify and describe the natural materials on the page. Then encourage students to look at the picture of the house. Have students color the frames around the materials they might use to build a house. *What materials can you use to build a house?* (Answers: *wood* and *rocks*)

**4 Write one kind of material you might use to make a pillow.**

Hold up a pillow. Have students take turns touching it. *How does it feel?* (Answer: *soft.*) *Look at the pictures of wood, rocks, and cotton on the page. What material can you use to make a pillow?* *Cotton.* Have students write the word *cotton* on the line.

**5 What material is soft? What materials are hard? Say with a partner.**

Pair students. Have pairs look at the pictures of the materials on the page. *What material is soft?* (Answer: *cotton*) *What materials are hard?* (*rocks and wood*) Have pairs answer.




## Elaborate

**Science Notebook: Natural Materials**

Have students draw pictures of two common objects in their Science Notebooks. The drawings should depict items made out of natural materials. One drawing must show a soft object and the other one a hard object. Encourage students to label their pictures. Provide language support if necessary.

## Think!

Write the following questions on the board: *What classroom objects are made of man-made materials? Which ones are made of natural materials?* Pair students and encourage them to answer the questions. Accept all logical answers.

### I Will Know...

Have students do the *I Will Know…* Digital Activity.

Lesson 2

# What are objects made of?

**Objective:** Identify man-made materials.

**Vocabulary:** *man-made, plastic cup, packing foam*

**Digital Resources:** Flash Card (*plastic*), *Lesson 2 Check* (print out 1 per student), *Got it? 60-Second Video*

**Materials:** chart paper, marker, old magazines, safety scissors, glue, tape

**Build Background** Display the *plastic* Flash Card. Write the word *plastic* on the board. *This is a plastic cup. Plastic is not a natural material. People make plastic using natural materials. Plastic is a man-made material.* Reinforce that things made by people are referred to as *man-made*.

## Explain

**6 Read and write two things people can make out of plastic.**

Have students read the text along with you. Have them look at the pictures and identify them. *Are the cup and the packing foam made out of plastic?* (Answer: *Yes*.) Next, have students think of other things people can make out of plastic. Encourage them to write them on the lines.

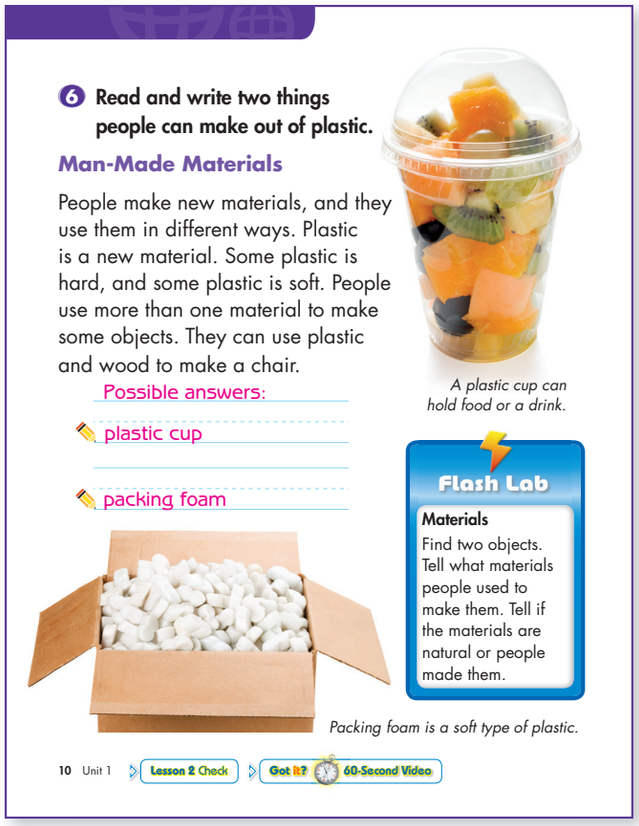
## Elaborate

### What Things Are Made Of Chart

Draw a large three-column chart on chart paper. Title the chart *What Things Are Made Of*. Label the first column *Natural Materials*, the second column *Man-Made Materials*, and the third column *Both*. Have students cut out pictures of objects from old magazines. Allow them to bring up their pictures and glue them in the appropriate columns on the chart. Attach the chart to a classroom wall.

## Think!

Write the following question on the board: *Is metal a natural or a man-made material?* Pair students and encourage them to answer the question. (Answer: *natural*)



6 Read and write two things people can make out of plastic.

**Man-Made Materials**

People make new materials, and they use them in different ways. Plastic is a new material. Some plastic is hard, and some plastic is soft. People use more than one material to make some objects. They can use plastic and wood to make a chair.

Possible answers:

plastic cup

packing foam

*A plastic cup can hold food or a drink.*

**Flash Lab**

**Materials**

Find two objects. Tell what materials people used to make them. Tell if the materials are natural or people made them.

*Packing foam is a soft type of plastic.*

10 Unit 1 Lesson 2 Check Got it? 60-Second Video

## Evaluate

### Lesson 2 Check Assessment for Learning

Distribute the *Lesson 2 Check* and guide students as they complete it. Check answers as a class. Then ask students to grade their progress on the topic of natural and man-made materials from 1 to 3: 3 = *I understand that materials can be natural or man-made*; 2 = *I need to study more*; 1 = *I need help!* Encourage students giving themselves a 1 or 2 to describe what they found difficult and what they need to study more.

### Got it? 60-Second Video

Review Key Words for Lesson 2 (see Student's Book page 8). Play the *Got it? 60-Second Video* to review the lesson material.

Lesson 3

# What is the design process?

**Objective:** Identify and learn the following steps of the design process: identify a problem; plan and draw.

**Vocabulary:** *shelter, design, wood duck, build, house*

**Digital Resources:** Flash Cards (*goal*, *solution*), *Let's Explore!* Digital Lab

**Materials:** white paper (1 sheet per student), art supplies, tape

## Unlock the Big Question

Write the following text on the board: *I will learn about the design process and how to use it to find a solution.*

**Build Background** Display the *goal* Flash Card. *A goal is something you want to do. Look at this wood duck. Wood ducks have a problem. They do not make their own homes or shelters. They need help. Now, we have a goal. We are going to design a house for the wood duck. What is the best solution?* Display the *solution* Flash Card. (Answer: *A wood duck house.*)

## Explore

**Let's Explore! Lab** **Which design works best?**

**Objective:** Observe different kinds of bird feeders and identify which design works best.

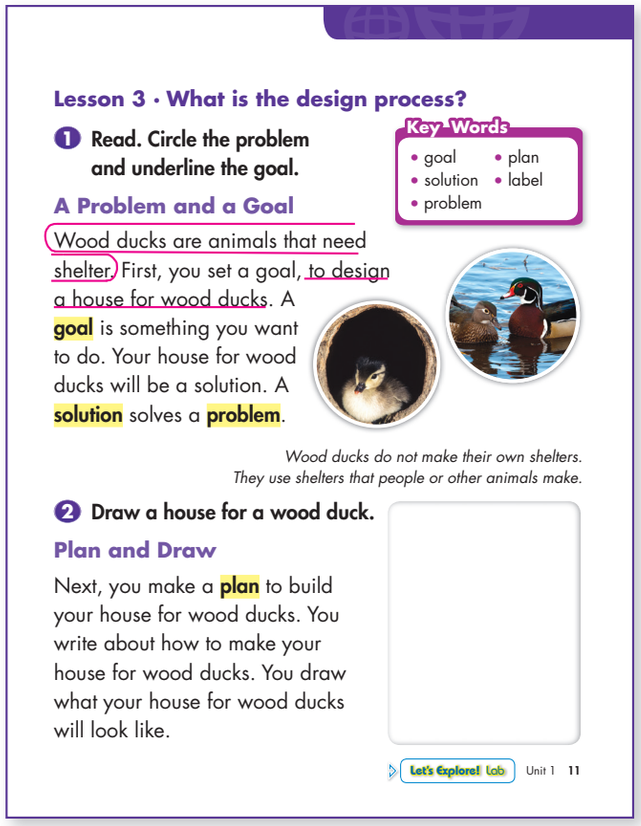
**Digital Resources:** *Let's Explore!* Digital Lab, *Let's Explore! Activity Card* (1 per student) (*Optional*: Do the lab in class; refer to the *Activity Card* for materials and steps.)

- *We will watch a video to observe three designs for bird feeders. We will decide which one works best.*
- Show the Digital Lab. *What are the three kinds of bird feeders?* (Answer: *The milk carton feeder, the raised feeder, and the hanging suet feeder.*)
- Show the Digital Lab again. *Which design works best?* (Possible answer: *The raised feeder.*) *Why?* (*Birds can reach their food more easily.*)
- Have students complete the *Activity Card*.

## Explain

### 1 Read. Circle the problem and underline the goal.

Have students read the text along with you. Encourage them to circle the problem wood ducks have. (*Wood ducks are animals that need shelter.*) Then ask students to underline a goal. *To design a house for wood ducks.*



Lesson 3 · What is the design process?

1 Read. Circle the problem and underline the goal.

Key Words
- goal
- plan
- solution
- label
- problem

A Problem and a Goal

Wood ducks are animals that need shelter. First, you set a goal, to design a house for wood ducks. A goal is something you want to do. Your house for wood ducks will be a solution. A solution solves a problem.

*Wood ducks do not make their own shelters. They use shelters that people or other animals make.*

2 Draw a house for a wood duck.

Plan and Draw

Next, you make a plan to build your house for wood ducks. You write about how to make your house for wood ducks. You draw what your house for wood ducks will look like.

Let's Explore! Lab Unit 1 11

### 2 Draw a house for a wood duck.

Explain to students that, now that they have identified the problem and have found a solution, they need a plan to build a house for a wood duck. Before building the house, they need to sketch it. Encourage students to draw the house in the space provided. Invite volunteers to share their drawings with the class.

## Elaborate

### Goals Collage

*My goal is to exercise every day.* On the board, sketch yourself exercising. Distribute sheets of white paper and art supplies. Encourage students to set a goal for themselves and draw it. Collect all drawings and attach them to a classroom wall to make a collage.

## Think!

Write the following question on the board: *Why do people have to help wood ducks?* (Possible answer: *They cannot make their own shelters. They cannot live without a shelter to protect them.*)

Lesson 3

# What is the design process?

**Objective:** Identify and learn the following step of the design process: choose materials.

**Vocabulary:** *wall, tape, screen*

**Digital Resources:** *I Will Know...* Digital Activity

**Build Background** Direct students to the picture of the wood duck house shown on the page. Have them identify the parts of the house: roof, floor, sides, parts that attach the box to a tree, the hole, and so on. Brainstorm with students materials they would need to build such a house. Write the list of materials on the board and leave them for later use.

## Explain

**3 Read. Look and circle three materials you need to make a house for wood ducks.**

Have students read the text along with you. Next, have them identify the materials at the bottom of the page. Have them circle three materials they would use to build a wood duck house. Discuss as a class. Finally, ask students to look at the list of materials on the board and check if any of the materials they thought of are shown on the page.

## Think!

On the board, write *What safety rules do you have to follow when you build a wood duck house?* (Possible answers: *I need to wear safety goggles when cutting materials. I have to be careful with the hammer and the nails. I have to ask an adult to help me put the house together.*)


## Elaborate

**Science Notebook: Make a Plan**

Have students imagine a new object or piece of furniture for their classroom. Have them think of a plan for making the object. Ask them to draw a sketch of the item they plan to make. Have volunteers share their drawings.

### I Will Know...

Have students do the *I Will Know...* Digital Activity.

Lesson 3

# What is the design process?

**Objective:** Identify and learn the following steps of the design process: make a test; record and share.

**Vocabulary:** *test, record, share, nail, hole*

**Digital Resources:** *Lesson 3 Check* (print out 1 per student), *Got it? 60-Second Video*

**Build Background** Encourage students to recall the steps of the design process they have learned so far. Write them on the board and have students read them along with you. Next, have students say how they will know if the wood duck house works well. Lead them into saying they have to check or test the house. *How can you test the house?* Accept all logical answers.

## Explain

**4 Read. How do you know your house for wood ducks works well? Say with a partner.**

Have students read the text along with you. Pair students and have them answer the question. *How do you know your wood duck house works well?* (Possible answer: *Wood ducks live in the house.*)

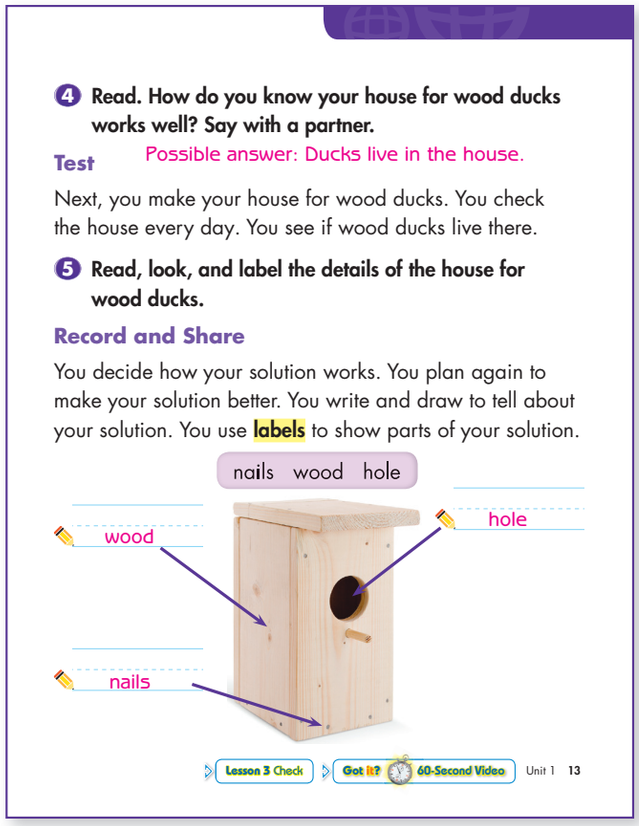
**5 Read, look, and label the details of the house for wood ducks.**

Have students read the text along with you and ask comprehension questions. *Once you decide your solution works, what do you have to do? Plan again to make the solution better. How do you plan again? I write and draw to tell about my solution.* Have students look at the drawing of the wood duck house at the bottom of the page. Have students label each part of the house. *How does labeling a picture help you and others when trying to solve a problem?* (Possible answer: *Labels help me identify important parts of my design. They help others see what materials I use and how I put them together.*)

### ELL Language Support

Use the steps of the design process to reinforce sequence words. Write the steps on the board. Ask questions such as:

- *What do you do first?* (Answer: *First, I find the problem.*)
- *What happens next?* (Answer: *Next, I plan and draw.*)
- *What happens then?* (Answer: *Then I choose materials.*)
- *What happens last?* (Answer: *Last, I test, record, and share.*)




## Think!

Write the following question on the board: *What can you do if your wood duck house does not work?* Invite volunteers to answer. (Possible answer: *I can look back at my design and make it better.*)

## Evaluate

**Lesson 3 Check** **Assessment for Learning**

Distribute the *Lesson 3 Check* and guide students as they complete it. Check answers as a class. Then ask students to grade their progress on the topic of the design process from 1 to 3: 3 = *I understand the steps of the design process*; 2 = *I need to study more*; 1 = *I need help!* Encourage students giving themselves a 1 or 2 to describe what they found difficult and what they need to study more.

**Got it? 60-Second Video**

Review Key Words for Lesson 3 (see Student's Book page 11). Play the *Got it? 60-Second Video* to review the lesson material.

# Let's Investigate!

In this unit, students learn the steps of the design process. In this lab, they will apply the concepts of designing, building, testing, recording, redesigning, and sharing results.

**Let's Investigate! Lab** **How can you build a boat?**

**Objective:** Students will design a foil boat that will hold weight while floating in water.

**Materials:** gram cubes, aluminum foil, rectangular plastic tubs (shoebox size), water, paper towels, white paper (1 sheet per group), pencils

**Digital Resources:** *Let's Investigate! Activity Card* (1 per group)

**Advance Preparation:** Measure and cut sheets of foil for each group.

- Divide the class into small groups and distribute materials.
- Fill plastic tubs with room-temperature water and set out a tub for each group. Have paper towels on hand to wipe up any spills.
- Encourage students to begin by drawing a sketch of their boat design.
- Next, invite students to build their boats.
- Have extra sheets of foil available in case students need to start building their boats again.
- Invite each group to test its boat in its tub of water. Ask students to put the boat inside the plastic tub of water. Help them notice that the boat floats. Then ask student to add gram cubes until the boat sinks.
- Have children record how many gram cubes the boat could hold before sinking.
- Encourage the group to redesign its boat so it can hold more gram cubes.
- Have students predict how many gram cubes their new boats can hold before sinking.
- Have students test their prediction.
- Repeat the same procedure with each group.

**Teacher Time-Saving Option:** Show the *Let's Investigate!* Digital Lab as an alternative to the hands-on lab activity.


**Class Project: Science and Technology Collage**

**Materials:** Per group: black construction paper, magazines with pictures for science and technology, scissors, glue

**Instructions:** Divide the class into small groups and distribute materials. Invite students to open the magazines and describe science and technology pictures: *This is a microscope. These are computers.* Monitor and provide vocabulary support as needed. Ask students to cut out the pictures that relate to the topic. Then ask them to organize all the pictures into a collage on top of the black construction paper. Allow groups time to glue the pictures into position. Once the groups have finished, encourage them to describe their collages to each other before presenting their information to the whole class.

## Unlock the Big Question


Have students refer to the Big Question on the Unit Opener page. In pairs, have them recall the steps of the design process. Have pairs or groups complete Questions 5 and 6 on the *Activity Card*.

# Unit 1 Review

## How do you solve problems?

**Digital Resources:** Print out 1 of each per student: *Got it? Self Assessment, Got it? Quiz*

## Evaluate

### Strategies for Targeted Review

The following are strategies for providing targeted review for students if they encounter challenges with the content.

#### Lesson 1 What is technology?

**Question 1**

If… students are having difficulty identifying the word that best completes the sentence about what technology helps solve, then… direct students to Lesson 1. Encourage them to review what technology is and what it helps us solve.

#### Lesson 2 What are objects made of?

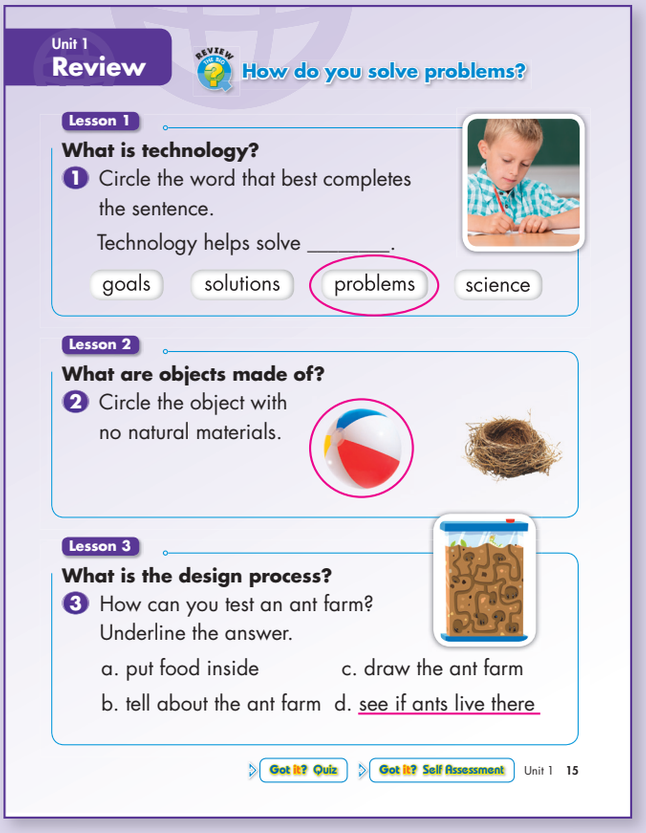
**Question 2**

If… students are having difficulty identifying the object with no natural materials, then… point to objects around the room and ask students to say if the objects are made with natural or man-made materials. For example, point to the door. *The door is made of wood. Is wood a natural or a man-made material?* (Answer: *natural*) Then point to a plastic item. *Is the (chair) made with natural or man-made materials?* (Answer: *man-made*) Repeat the procedure with other objects.

#### Lesson 3 What is the design process?

**Question 3**

If… students are having difficulty identifying how you can test an ant farm, then… have them recall how they tested the wood duck house. *How do you know the wood duck house worked?* (Answer: *Wood ducks lived there.*) Then explain to students that they can test an ant house in the same manner.


Unit 1 Review

How do you solve problems?

Lesson 1

What is technology?

1 Circle the word that best completes the sentence.

Technology helps solve _____.

goals solutions problems science

Lesson 2

What are objects made of?

2 Circle the object with no natural materials.

Lesson 3

What is the design process?

3 How can you test an ant farm? Underline the answer.

a. put food inside c. draw the ant farm

b. tell about the ant farm d. see if ants live there

Got it? Quiz Got it? Self Assessment Unit 1 15

### ELL Language Support

Before students start working on the Review activities, have them read each question aloud along with you.

### Got it? Self Assessment

Immediately after students have completed the Review activities, distribute a *Got it? Self Assessment* to each student. Have students complete the *Stop! Wait!* and *Go!* statements for each lesson, allowing them to look back through the lesson material if necessary.

### Got it? Quiz

Distribute a Unit 1 *Got it? Quiz* to each student. Quizzes may be used for assessing students' understanding of unit concepts as well as for grading purposes.

## Lesson 1 Check

Name _____ Date _____

### Words to Know

Circle the word that best completes the sentence.

**1.** **Discovery** / **Technology** is using science to solve problems.

### Explain

Answer the questions below.

**2.** A seat belt is technology. Write how it helps people.

It helps people stay safe in a car.

**3.** Draw an example of technology.

Answers will vary.
Drawing should show an object built to solve a problem.

### Apply Concepts

**4.** Write how telephones help people.

Possible answer: Telephones help people who are far away from each other talk.




## Lesson 2 Check

Name _____ Date _____

### Words to Know

Write the word that goes with each definition.

| natural | man-made |
|---|---|

**1.** man-made something made by people

**2.** natural something not made by people

### Explain

**3.** Draw pictures to demonstrate the meaning of the words.

| | | |
|---|---|---|
| natural | man-made | both |

### Apply Concepts

**4.** You have an apple and a plastic lunch box. Which is a natural material? Which is made by people? Tell how you know.

The apple is a natural material. The lunch box is made by people. Apples come from Earth. Plastic is a new material made by people.




## Lesson 3 Check

Name _____ Date _____

### Words to Know

Write the word that goes with each definition.

| goal | solution |
|---|---|

**1.** solution something that solves a problem

**2.** goal something you want to do

### Explain

**3.** Read the steps of the design process. Write them in the correct order.

**Steps of the Design Process**
- ☐ record and share
- ☐ plan and draw
- ☐ make and test
- ☐ find a problem
- ☐ choose materials
- ☐ state a goal

find a problem
state a goal
plan and draw
choose materials
make and test
record and share

### Apply Concepts

**4.** Name a problem you could solve using the design process. List your goal. Tell how you would test your plan.

Answers will vary. Students should identify a specific problem and solution, as well as a test that would result in a better understanding of how to solve the problem.




## Lesson 1 Let's Explore! Activity Card

Name _____ Date _____

**Materials**
- plastic cubes
- pencils
- forceps

### Which tool works better?

**1.** Predict. Which tool from the list will pick up cubes better?

**2.** Use each tool to pick up cubes.

### Explain Your Results

**3.** What happened when you used each tool?

Possible answer: I dropped cubes using the pencils. I did not drop cubes using the forceps.

**4.** Which tool worked better? Explain.

Possible answer: The forceps worked better because they held onto the cubes well.

What did you learn from this activity?

Possible answer: Some tools are more useful than others when trying to do an activity.

Unit 1

## Lesson 2 Explore My Planet! Activity Card

Name _____ Date _____

### Invention: Orville Redenbacher

**1.** Underline what Orville Redenbacher tested.

Do you like to eat popcorn? Orville Redenbacher wanted to find the kind of corn that made the best popcorn. He grew many different kinds of popcorn. He tested many kinds of corn. Finally, he found a corn that made good popcorn.

Write something you would like to test.

Possible answer: I would test what shape of crayon writes best.

Tell a way you could test your idea.

Possible answer: I could melt crayons and make them into three shapes. I could give three people one of each shape and have them test and report on which shape worked best.




Unit 1

## Lesson 3 Let's Explore! Activity Card

Name _____ Date _____

**Materials**

- binder clips
- scissors
- string
- bird food
- suet for birds
- containers
- empty milk carton

### Which design works best?

**1.** Decide on a bird feeder to build.

**2.** Build it. Put it outside.

**3.** Observe for 5 days.

**4.** Record. Compare your feeder with others.

### Explain Your Results

**5.** Which design worked the best?

Possible answer: The hanging suet feeder worked the best.

**6.** How can you redesign your feeder to attract more birds?

Possible answer: I could use a bigger container.

How could you change your feeder to attract other types of animals?

Possible answer: I could put my feeder on the ground so squirrels could eat from it.




Unit 1

## Let's Investigate! Activity Card

Name _____ Date _____

### Analyze and Conclude

**5.** Draw a conclusion. Did your boat hold more or fewer cubes than your prediction?

Possible answer: My boat held more gram cubes than I predicted.

**6.** How did you redesign your boat to hold more gram cubes?

Possible answer: I made my boat longer.




Unit 1

## Lessons 1–3 Got it? Self Assessment

Name _____ Date _____

### Got it? Self Assessment

Complete the statements for each lesson.

**Lesson 1 What is technology?**

**Stop! I** need help with _____

**Wait! I** have a question about _____

**Go! Now I** know _____

**Lesson 2 What are objects made of?**

**Stop! I** need help with _____

**Wait! I** have a question about _____

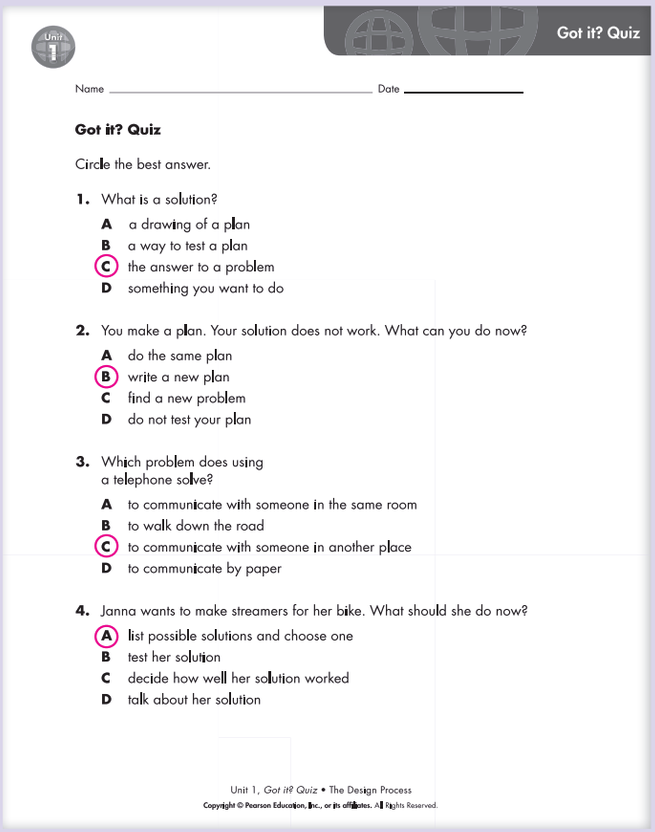
**Go! Now I** know _____

**Lesson 3 What is the design process?**

**Stop! I** need help with _____

**Wait! I** have a question about _____

**Go! Now I** know _____



Got it? Quiz

Name _____ Date _____

**Got it? Quiz**

Circle the best answer.

**1.** What is a solution?
- **A** a drawing of a plan
- **B** a way to test a plan
- **C** the answer to a problem
- **D** something you want to do

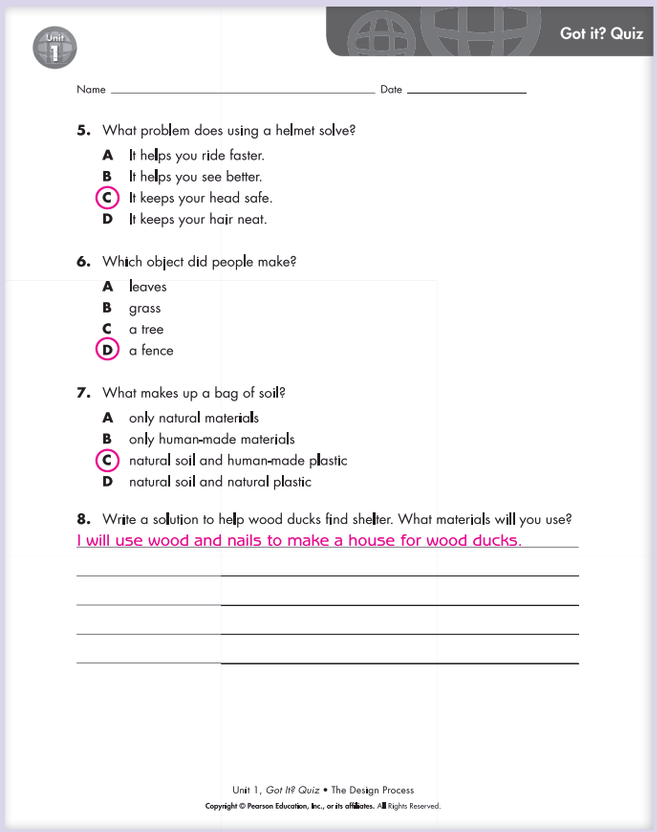
**2.** You make a plan. Your solution does not work. What can you do now?
- **A** do the same plan
- **B** write a new plan
- **C** find a new problem
- **D** do not test your plan

**3.** Which problem does using a telephone solve?
- **A** to communicate with someone in the same room
- **B** to walk down the road
- **C** to communicate with someone in another place
- **D** to communicate by paper

**4.** Janna wants to make streamers for her bike. What should she do now?
- **A** list possible solutions and choose one
- **B** test her solution
- **C** decide how well her solution worked
- **D** talk about her solution

Unit 1, *Got it? Quiz* • The Design Process





Got it? Quiz

Name _____ Date _____

**5.** What problem does using a helmet solve?
- **A** It helps you ride faster.
- **B** It helps you see better.
- **C** It keeps your head safe.
- **D** It keeps your hair neat.

**6.** Which object did people make?
- **A** leaves
- **B** grass
- **C** a tree
- **D** a fence

**7.** What makes up a bag of soil?
- **A** only natural materials
- **B** only human-made materials
- **C** natural soil and human-made plastic
- **D** natural soil and natural plastic

**8.** Write a solution to help wood ducks find shelter. What materials will you use?

I will use wood and nails to make a house for wood ducks.

Unit 1, *Got It? Quiz* • The Design Process



## Teacher's Notes

## Unit 1 Study Guide

### How do you solve problems?

Lesson 1
**What is technology?**

- Technology is any tool that helps people.
- People use technology to solve problems.

Lesson 2
**What are objects made of?**

- Materials not made by people are natural.
- People use materials for different things.

Lesson 3
**What is the design process?**

- Something you want to do is a goal.
- You can record your solutions with labels.

# Review the Big Question

### How do you solve problems?

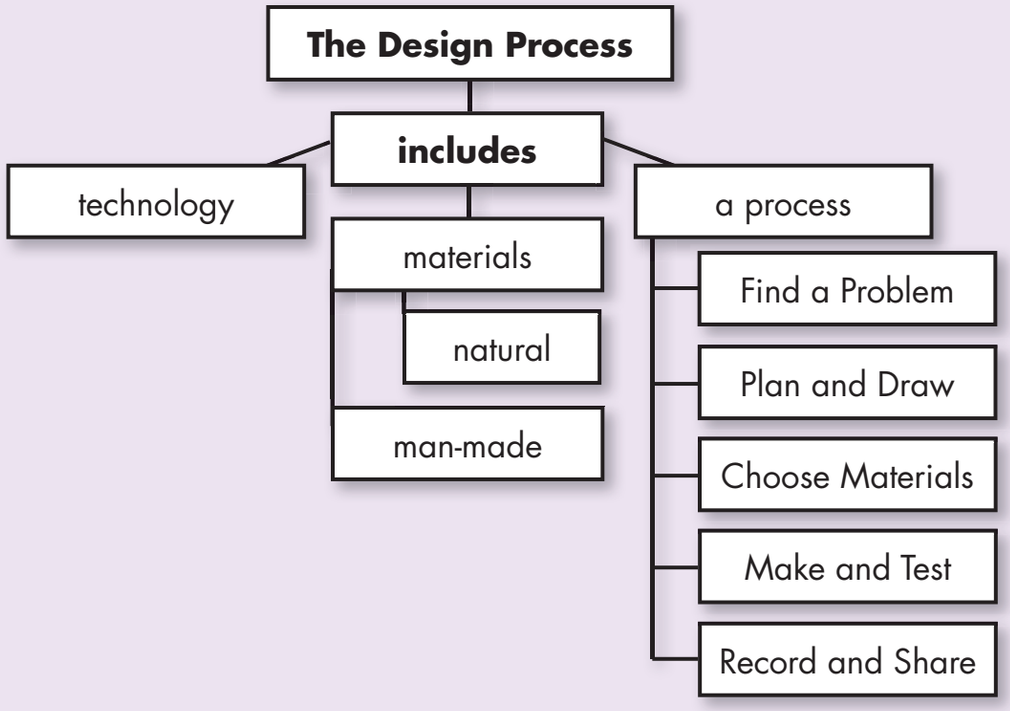
Have students use what they have learned from the unit to answer the question in their own words.

*How has your answer to the Big Question changed since the beginning of the unit? What are some things you learned that caused your answer to change?*

### Make a Concept Map

Have students make a concept map like the one shown on this page to help them organize key concepts.

## Unit 1 Concept Map




Students can make a concept map to help review the Big Question.