

# Introducing the Vocabulary

# **Learning Objectives**

• Identify the products and function of photosynthesis.

### **Materials**

- Print the following worksheets and data sheets:
  - Unit 93 Lesson 1 SCI Photosynthesis
     Definition and Picture Cards Worksheet
  - Unit 93 Lesson 1 SCI Photosynthesis
     Vocabulary Matching Worksheet Lv 2/3
     (per Level 2 and 3 student and teacher)
  - Unit 93 Lesson 1 SCI Photosynthesis Fill in the Blank Worksheet Lv 3 (per Level 3 student and teacher)
  - Classroom Resources Yes/No Cards
     Worksheet (per Level 1 student)
  - Constant Time Delay Individual (per student) or Group Data Sheet

- System of Least Prompts Individual (per student) or Group Data Sheet
- Gather the following materials from the enCORE Manipulatives Kit and/or your classroom:
  - Magnetic Whiteboard
  - Magnetic Picture Pockets
  - Dry erase marker
  - Scissors (per Level 2 and 3 student)
  - Glue (per Level 2 and 3 student)
  - Pencil (per Level 3 student)

#### **Prior to Instruction**

To prepare for teaching this lesson segment, follow these steps:

- 1. Gather, print, and prepare all materials listed above.
- 2. If you plan to program students' AAC devices, program the following words:

LEVEL 1	LEVEL 2	LEVEL 3
<ul> <li>vocabulary words         (photosynthesis, chloroplast, chlorophyll, reactants, oxygen, products)     </li> <li>plant</li> </ul>	<ul> <li>vocabulary words         (photosynthesis, chloroplast, chlorophyll, reactants, oxygen, products)     </li> <li>plant</li> </ul>	<ul> <li>vocabulary words         (photosynthesis, chloroplast, chlorophyll, reactants, oxygen, products)     </li> <li>plant</li> </ul>
<ul><li>water</li><li>carbon dioxide</li><li>sunlight</li></ul>	<ul><li>water</li><li>carbon dioxide</li><li>sunlight</li></ul>	<ul><li>water</li><li>carbon dioxide</li><li>sunlight</li></ul>

### **Anchor Instruction for All Students**

Prior to beginning instruction, anchor instruction by referencing the Companion Text Unit 93 Lesson 1 Science Companion Text. This week, we will be reading Unit 93 Lesson 1 Science Companion Text. The subtitle of this companion text is Photosynthesis, and we will be learning more about how plants take in water, carbon dioxide, and sunlight to make food. The cells in a plant's leaves contain organelles called chloroplasts, which is where photosynthesis takes place. Is the green pigment inside of the chloroplast called the nucleus or the chlorophyll? Give students time to respond. Write "chlorophyll" on the Magnetic Whiteboard. That's right! Chlorophyll is the green substance in plants that absorbs light energy during photosynthesis. Let's learn more about photosynthesis!

# **Core Vocabulary and Concepts**

In this section, introduce the vocabulary listed below using either Constant Time Delay or System of Least Prompts. For details on these instructional methods, see the Core Vocabulary and Concepts Instructional Methods section at the front of this Teacher's Guide or access the Core Vocabulary and Concepts Instructional Methods resources under Resources > Instructional Methods on the enCORE 9-12 web-based application.

Materials: Unit 93 Lesson 1 SCI Photosynthesis Definition and Picture Cards Worksheet, Constant Time Delay Individual (per student) or Group Data Sheet, System of Least Prompts Individual (per student) or Group Data Sheet, Magnetic Whiteboard, Magnetic Picture Pockets, dry erase marker, scissors

**Prior to Instruction:** Select instructional method (i.e., Constant Time Delay or System of Least Prompts). Then, prepare the corresponding individual or group data sheet to collect data on your students as you teach the vocabulary below. Cut apart the Picture and Definition Cards from the Photosynthesis Definition and Picture Cards Worksheet. Place all cards into the Magnetic Picture Pockets. Place the Definition Cards on the left side of the Magnetic Whiteboard. Place the Picture Cards on the right side of the Magnetic Whiteboard.

VOCABULARY WORD	DEFINITION	LEVELS
photosynthesis	the process where a green plant takes in water and carbon dioxide to make food (sugar) and oxygen when the plant is exposed to light	1, 2, 3
chloroplast	the location where plant cells make their own food (photosynthesis)	1, 2, 3
chlorophyll	a green substance inside the chloroplast that absorbs light energy during photosynthesis	1, 2, 3
reactants	the ingredients needed for a chemical reaction to occur	1, 2, 3
oxygen	a natural, colorless, odorless gas produced during photosynthesis	1, 2, 3
products	something that is created at the end of a chemical reaction	1, 2, 3

# **Concept Building**

Materials: Unit 93 Lesson 1 SCI Photosynthesis Definition and Picture Cards Worksheet, Unit 93 Lesson 1 SCI Photosynthesis Vocabulary Matching Worksheet Lv 2/3 (per Level 2 and 3 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis Fill in the Blank Worksheet Lv 3 (per Level 3 student and teacher), Classroom Resources Yes/No Cards Worksheet, System of Least Prompts Individual (per student) or Group Data Sheet, Magnetic Whiteboard, Magnetic Picture Pockets, scissors (per Level 2 and 3 student), glue (per Level 2 and 3 student), pencil (per Level 3 student)

**Prior to Instruction:** Place all cards from the Photosynthesis Definition and Picture Cards Worksheet into the Magnetic Picture Pockets. Place the Definition Cards on the left side of the Magnetic Whiteboard. Place the Picture Cards facing up on the table in front of the students. If needed, cut out the Picture Cards from the Photosynthesis Vocabulary Matching Worksheet Lv 2/3. Cut apart the Yes/No Cards from the *Classroom Resources* Yes/No Cards Worksheet for each Level 1 student.

#### LEVEL 1

Provide each student a set of Yes/No Cards from the Yes/No Cards Worksheet.

Plants need specific ingredients or reactants for photosynthesis to occur. Plants need water, carbon dioxide, and sunlight. Do plants take in water through their flowers? Give students time to respond using the Yes/No Cards. That's right! No, plants take in water through their roots. Carbon dioxide is a gas found in the air. Do plants capture carbon dioxide through their leaves? Give students time to respond using the Yes/No Cards. Nice work! Yes, plants take in carbon dioxide through tinu holes in their leaves. Stomata are the small pores that open and close in a plant leaf, which allows gases to enter and exit. The chlorophyll is located inside the chloroplast on a plant cell's leaves. Does chlorophyll take in soil? Give students time to respond

(continued)

## LEVEL 2

Plants need specific ingredients or reactants for photosynthesis to occur. Specifically, plants need water, carbon dioxide, and sunlight. Do plants take in water through their flowers or through their roots? Give students time to respond. That's right! Plants take in water through their roots. Carbon dioxide is a gas found in the air. Do plants capture carbon dioxide through their leaves or through their stems? Give students time to respond. Nice work! Plants take in carbon dioxide through tiny holes in their leaves. Stomata are the small pores that open and close in a plant leaf, which allows gases to enter and exit. The chlorophyll is located inside the chloroplast on a plant cell's leaves. Does chlorophyll take in soil or sunlight? Give students time to respond. Excellent! Chlorophyll takes in sunlight. After taking in

(continued)

#### LEVEL 3

Plants need specific ingredients or reactants for photosynthesis to occur. What are the three main reactants needed for photosynthesis to occur? Give students time to respond. Amazing job! Plants need water, carbon dioxide, and sunlight for photosynthesis to occur. Do plants take in water through their flowers, roots, or seeds? Give students time to respond. That's right! Plants take in water through their roots. Carbon dioxide is a gas found in the air. Do plants capture carbon dioxide through their leaves, roots, or stems? Give students time to respond. Nice work! Plants take in carbon dioxide through tiny holes in their leaves. Stomata are the small pores that open and close in a plant leaf, which allows gases to enter and exit. The chlorophyll is located inside the chloroplast on a plant cell's leaves. Does

(continued)

using the Yes/No Cards. Excellent! No, chlorophyll takes in sunlight. After taking in these key ingredients or reactants, do plants produce food or sugar in the form of glucose and oxygen? Give students time to respond using the Yes/ No Cards. Terrific! Yes, at the end of photosynthesis, plants make sugar in the form of glucose and oxygen. These are the products of photosynthesis. Do plants use oxygen as their energy source? Give students time to respond using the Yes/No Cards. Fantastic! No, plants use glucose as their energy source. The oxygen produced during photosynthesis is released into the air. All humans and animals need oxygen to survive. Let's learn more about the vocabulary words: photosynthesis, chloroplast, chlorophyll, reactants, oxygen, and products. Point to the Definition Cards on the left side of the Magnetic Whiteboard as you are talking.

these key ingredients or reactants, do plants produce sugar in the form of glucose and hydrogen? Give students time to respond. Terrific! No, at the end of photosynthesis, plants produce sugar in the form of glucose and oxygen. These are the products of photosynthesis. Do plants use glucose or oxygen as their energy source? Give students time to respond. Fantastic! Plants use glucose as their energy source. The oxygen produced during photosynthesis is released into the air. All humans and animals need oxygen to survive. Let's learn more about the vocabulary words: photosynthesis, chloroplast, chlorophyll, reactants, oxygen, and products. Point to the Definition Cards on the left side of the Magnetic Whiteboard as you are talking.

chlorophyll take in soil, nitrogen, or sunlight? Give students time to respond. **Excellent! Chlorophyll** takes in sunlight. After taking in these key ingredients or reactants, what do plants produce? Give students time to respond. Terrific! At the end of photosynthesis, plants produce sugar in the form of glucose and oxygen. These are the products of photosynthesis. What do plants use as their energy source? Give students time to respond. Fantastic! Plants use glucose as their energy source. The oxygen produced during photosynthesis is released into the air. All humans and animals need oxygen to survive. Let's learn more about the vocabulary words: photosynthesis, chloroplast, chlorophyll, reactants, oxygen, and products. Point to the Definition Cards on the left side of the Magnetic Whiteboard as you are talking.

Place the Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet facing up on the table in front of the students.

I'll go first. Hold up two
Picture Cards (one correct and
one distractor). Watch me
touch photosynthesis. Point
to the correct Picture Card.
This is photosynthesis. Place
the Picture Card next to the

Place the Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet facing up on the table in front of the students.

I'll go first. Hold up two
Picture Cards (one correct
and one distractor). Which is
the process where a green
plant takes in water and
carbon dioxide to make
food (sugar) and oxygen

Place the Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet facing up on the table in front of the students.

I'll go first. Choose a Picture
Card from the table. This is
photosynthesis. I'm going
to find the Definition
Card on the Magnetic
Whiteboard that describes
photosynthesis. Point to the

MODEL

	LEVEL 1	LEVEL 2	LEVEL 3
	matching Definition Card on the Magnetic Whiteboard. Read the definition.	when the plant is exposed to light? Point to the correct Picture Card. This is photosynthesis. I'll put the Picture Card here. Place the Picture Card next to the matching Definition Card on the Magnetic Whiteboard. Read the definition.	read it. Photosynthesis is the process where a green plant takes in water and carbon dioxide to make food (sugar) and oxygen when the plant is exposed to light. Place the Picture Card next to the matching Definition Card on the Magnetic Whiteboard.
GUIDED PRACTICE	Let's do the next one together. Call on a student and hold up two different Picture Cards, one correct and a distractor. Touch chloroplast. Wait for the student to respond by touching the Picture Card. Yes! That's chloroplast. Hold up the matching Definition Card next to the Picture Card and read the definition.  Repeat this procedure with the remaining Picture Cards until each student has had at least one turn.	Let's do the next one together. Call on a student and hold up two different Picture Cards, one correct and a distractor. Which is the location where plant cells make their own food (photosynthesis)? Wait for the student to respond by touching or identifying the Picture Card. Yes, that's chloroplast! Have the student place the Picture Card next to the matching Definition Card on the Magnetic Whiteboard. Assist students as needed with reading the definition.  Remove the Picture Card after each turn. Repeat this procedure until each student has had at least one turn.	Let's do the next one together. Choose another Picture Card from the table.  Where does photosynthesis occur? Wait for the students to respond. Yes, the chloroplast is where photosynthesis occurs.  What is the definition of chloroplast? Call on a student to respond.  Repeat with the remaining Picture Cards. If more students need a turn, remove all the Picture Cards from the Magnetic Whiteboard, and repeat the procedure.
INDEPENDENT PRACTICE	Now it's your turn. Call on a student and hold up two different Picture Cards, one correct and a distractor.  Touch [chlorophyll]. Give students time to respond. Yes, that's [chlorophyll]! Pick up the Definition Card, hold it next to the Picture Card, and read the definition.  Repeat this procedure for the remaining Picture Cards. You	Provide each student with a Photosynthesis Vocabulary Matching Worksheet Lv 2/3, scissors, and glue.  Now it's your turn. Cut out the Picture Cards on the bottom of your worksheet. Assist the students as needed with cutting apart the Picture Cards or cut these out for students before the lesson.  Then, place three Picture Cards	Provide each student with a Photosynthesis Vocabulary Matching Worksheet Lv 2/3, scissors, and glue.  Now it's your turn. Cut out the Picture Cards on the bottom of your worksheet. Assist the students as needed with cutting apart the Picture Cards or cut these out for students before the lesson.  (continued)

(continued)

(continued)

may either have one student complete all trials and then move on to the next student, or you may have each student take one to two turns at a time.

Use System of Least Prompts Individual (per student) or Group Data Sheet to collect data.

in front of the student (one correct and two distractors).

[Point to/Name] [a green substance inside the chloroplast that absorbs light energy during photosynthesis]. Give students time to respond. Yes, [chlorophyll is a green substance inside the chloroplast that absorbs light energy during photosynthesis]. Now, read the first definition. Give students time to read the first definition. Place [chlorophyll] in the box next to the definition. Assist students as needed with reading each definition and the text on the Picture Card. Repeat this procedure for the

remaining Picture Cards.

After students are done, check their work and have them alue the Picture Cards on the worksheet.

If the completed worksheet does not provide enough data, use System of Least Prompts Individual (per student) or Group Data Sheet to collect additional data as needed.

Read each definition. Match each Picture Card to its definition.

After students are done, check their work and have them alue the Picture Cards on the worksheet.

Provide each student with a Photosynthesis Fill in the Blank Worksheet Lv 3 and a pencil.

Next, complete the Photosunthesis Fill in the Blank Worksheet. Read each definition. Choose the answer that completes each definition. You can circle the answer on the right, or you can write the answer on the line provided.

After students are done, check their work and support them with making any changes, as needed.

If the completed worksheets do not provide enough data, use System of Least Prompts Individual (per student) or Group Data Sheet to collect additional data as needed.

	LEVEL 1	LEVEL 2	LEVEL 3
PROMPTING AND ERROR CORRECTION	Verbal Prompt: Find [chlorophyll].  Model Prompt: Watch me. Touch the correct Picture Card. This is [chlorophyll]. Your turn.  Physical Prompt: Do it with me. This is [chlorophyll]. Use hand-over-hand guidance and physically prompt the student to touch the [chlorophyll] Picture Card.	Verbal Prompt: Find [a green substance inside the chloroplast that absorbs light energy during photosynthesis].  Model Prompt: Watch me. Point to the correct Picture Card. This is [chlorophyll]. Place the Picture Card in the box next to the correct definition. Your turn.  Physical Prompt: Do it with me. This is [chlorophyll]. Use hand-over-hand guidance and physically prompt the student to place the [chlorophyll] Picture Card in the box next to the correct definition.	Verbal Prompt: Find [chlorophyll].  Model Prompt: Watch me. Point to the correct Picture Card. This is [chlorophyll]. Place the Picture Card in the box next to the correct definition. Your turn. Physical Prompt: Do it with me. This is [chlorophyll]. Use hand-over-hand guidance and physically prompt the student to place the [chlorophyll] Picture Card in the box next to the correct definition.
REINFORCE	Excellent job! You matched each vocabulary word related to photosynthesis to its definition.	Fantastic work! You matched each vocabulary word related to photosynthesis to its definition.	Terrific job! You matched each vocabulary word related to photosynthesis to its definition and completed the fill-in-the-blank activity.

Instructional Tip! At the end of the lesson segment, put each student's Definition and Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet into a small plastic bag for use in subsequent lesson segments.



# Understanding the Big Ideas

# **Learning Objectives**

• Identify the products and function of photosynthesis.

### **Materials**

- Print the following worksheets and data sheets:
  - Unit 93 Lesson 1 SCI Photosynthesis Full Image Worksheet Lv 2/3 (per Level 2 and Level 3 student and teacher)
  - Unit 93 Lesson 1 SCI Photosynthesis
     Sorting Worksheet Lv 2/3 (per Level 2 and Level 3 student and teacher)
  - Unit 93 Lesson 1 SCI Photosynthesis Reading Comprehension Questions Worksheet Lv 3 (per Level 3 student and teacher)
  - Unit 93 Lesson 1 SCI Photosynthesis
     Definition and Picture Cards
     Worksheet (print new copy or use copy from Segment 1)
  - Classroom Resources Yes/No Cards
     Worksheet (per Level 1 student)
  - Constant Time Delay Individual (per student) or Group Data Sheet

- System of Least Prompts Individual (per student) or Group Data Sheet
- Gather the following materials from the enCORE Manipulatives Kit and/or your classroom:
  - Unit 93 Lesson 1 Science Companion Text (hard copy with icons per Level 1 and 2 student and teacher)
  - Unit 93 Lesson 1 Science Companion Text (hard copy without icons per Level 3 student and teacher)
  - Magnetic Whiteboard
  - Magnetic Picture Pockets
  - Dry erase marker
  - Scissors (per Level 2 and 3 student)
  - Glue (per Level 2 and 3 student)
  - Pencil (per Level 3 student)
  - Notebook paper, if needed (per Level 3 student)

#### **Prior to Instruction**

To prepare for teaching this lesson segment, follow these steps:

- 1. Gather, print, and prepare all materials listed above.
- 2. If you plan to program students' AAC devices, program the following words:

LEVEL 1	LEVEL 2	LEVEL 3
<ul> <li>vocabulary words (photosynthesis, chloroplast, chlorophyll, reactants, oxygen, products)</li> <li>plant</li> <li>water</li> <li>carbon dioxide</li> <li>sunlight</li> </ul>	<ul> <li>vocabulary words         (photosynthesis, chloroplast,         chlorophyll, reactants,         oxygen, products)</li> <li>plant</li> <li>water</li> <li>carbon dioxide</li> <li>sunlight</li> </ul>	<ul> <li>vocabulary words         (photosynthesis, chloroplast,         chlorophyll, reactants,         oxygen, products)</li> <li>plant</li> <li>water</li> <li>carbon dioxide</li> <li>sunlight</li> </ul>

### **Anchor Instruction for All Students**

Prior to beginning instruction, anchor instruction by referencing the Companion Text Unit 93 Lesson 1 Science Companion Text. This week, we will be reading Unit 93 Lesson 1 Science Companion Text. The subtitle of this companion text is Photosynthesis. We will learn about the process where green plants take in water and carbon dioxide to make food and oxygen when exposed to light. What are reactants? Give students time to respond. Correct! Reactants are the ingredients needed for a chemical reaction to occur. Hold up the teacher's copy of the Photosynthesis Full Image Worksheet Lv 2/3. Point to each reactant. Carbon dioxide, water, and sunlight are the reactants needed for photosynthesis. Let's read to learn more about photosynthesis!

# **Core Vocabulary and Concepts**

In this section, introduce the vocabulary listed below using either Constant Time Delay or System of Least Prompts. For details on these instructional methods, see the Core Vocabulary and Concepts Instructional Methods section at the front of this Teacher's Guide or access the Core Vocabulary and Concepts Instructional Methods resources under Resources > Instructional Methods on the enCORE 9-12 web-based application.

Materials: Unit 93 Lesson 1 SCI Photosynthesis Definition and Picture Cards Worksheet (use copy from Segment 1), Constant Time Delay Individual (per student) or Group Data Sheet, System of Least Prompts Individual (per student) or Group Data Sheet, Magnetic Whiteboard, Magnetic Picture Pockets

**Prior to Instruction:** Select instructional method (i.e., Constant Time Delay or System of Least Prompts). Then, prepare the corresponding individual or group data sheet to collect data on your students as you teach the vocabulary below. Place all the cards from the Photosynthesis Definition and Picture Cards Worksheet into the Magnetic Picture Pockets. Place the Definition Cards on the left side of the Magnetic Whiteboard. Place the Picture Cards on the right side of the Magnetic Whiteboard.

VOCABULARY WORD	DEFINITION	LEVELS
photosynthesis	the process where a green plant takes in water and carbon dioxide to make food (sugar) and oxygen when the plant is exposed to light	1, 2, 3
chloroplast	the location where plant cells make their own food (photosynthesis)	1, 2, 3

enC@RE

VOCABULARY WORD	DEFINITION	LEVELS
chlorophyll	a green substance inside the chloroplast that absorbs light energy during photosynthesis	1, 2, 3
reactants	the ingredients needed for a chemical reaction to occur	1, 2, 3
oxygen	a natural, colorless, odorless gas produced during photosynthesis	1, 2, 3
products	something that is created at the end of a chemical reaction	1, 2, 3

#### **Read and Review the Text**

Materials: Unit 93 Lesson 1 Science Companion Text (hard copy with icons per Level 1 and 2 student), Unit 93 Lesson 1 Science Companion Text (hard copy without icons per Level 3 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis Full Image Worksheet Lv 2/3 (per Level 2 and 3 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis Sorting Worksheet Lv 2/3 (per Level 2 and Level 3 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis Reading Comprehension Questions Worksheet Lv 3 (per Level 3 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis Definition and Picture Cards Worksheet (print new copy or use the copy from Segment 1), Classroom Resources Yes/No Cards Worksheet (per Level 1 student), System of Least Prompts Individual (per student) or Group Data Sheet, Magnetic Whiteboard, Magnetic Picture Pockets, dry erase marker, scissors (per Level 2 and 3 student), glue (per Level 2 and 3 student), pencil (per Level 3 student), notebook paper, if needed (per Level 3 student)

**Prior to Instruction:** Reuse the Definition and Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1) for all students. Place all the cards in Magnetic Picture Pockets. On the Magnetic Whiteboard, write the vocabulary words: photosynthesis, chloroplast, chlorophyll, reactants, oxygen, and products. Below each vocabulary word, write a brief description (i.e., photosynthesis is the process where green plants make food and oxygen when exposed to light). Use for additional support with Level 2 and 3 students. Place the teacher's copy of the Photosynthesis Full Image Worksheet Lv 2/3 on the other side of the Magnetic Whiteboard.

	LEVEL 1	LEVEL 2	LEVEL 3
INTRODUCE	Hold up the Companion Text Unit 93 Lesson 1 Science Companion Text (hard copy with icons). Today we are going to read the Unit 93 Lesson 1 Science Companion Text. Let's learn about photosynthesis!	Hold up the Companion Text Unit 93 Lesson 1 Science Companion Text (hard copy with icons). Today we are going to read the Unit 93 Lesson 1 Science Companion Text. We are going to learn about photosynthesis!	Hold up the Companion Text Unit 93 Lesson 1 Science Companion Text (hard copy without icons). Today we are going to read the Unit 93 Lesson 1 Science Companion Text. We are going to learn about photosynthesis!
MODEL	Provide students with the Unit 93 Lesson 1 Science Companion Text (hard copy with icons) only if having their own copy would enhance learning and not be a distraction.  Provide each student a set of Yes/No Cards from the Yes/No	Provide students with the Unit 93 Lesson 1 Science Companion Text (hard copy with icons) and the Photosynthesis Full Image Worksheet Lv 2/3 to use for reference.  I will read first. Read from the first sentence and stop	Provide students with the Unit 93 Lesson 1 Science Companion Text (hard copy without icons) and the Photosynthesis Full Image Worksheet Lv 2/3 to use for reference.  I will read first. Read from the first sentence and stop

Cards Worksheet to answer the comprehension questions.

Use the Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1).

**Listen as I read.** Read from the first sentence and stop reading after "After a certain amount...".

Wow! Watch me touch [photosunthesis]. The process of baking cookies is a lot like photosynthesis. Do plants take in only water during photosynthesis? Give students time to respond. **Great! No. Plants take** in water, carbon dioxide, and sunlight during photosynthesis. At the end of the photosynthesis process, do plants produce sugar and oxygen? Give students time to respond. **Excellent! Yes! Plants** produce sugar in the form of glucose and oxygen. The oven provides energy needed for a chemical reaction when baking cookies. Does water provide the energy needed in photosynthesis? Give students time to respond. Good job! No. The Sun's light provides the energy needed for the chemical reaction of photosynthesis to occur. Let's continue reading to learn more about photosynthesis.

reading after "After a certain amount...".

Wow! Did you know the process of baking chocolate chip cookies is a lot like photosynthesis? Give students time to respond. Name one thing plants take in during the process of photosynthesis. Give students time to respond. Correct! During photosynthesis, plants take in water, carbon dioxide, and sunlight. At the end of the photosynthesis process, name one thing plants produce. Give students time to respond. Correct! Plants produce sugar in the form of glucose and oxygen. When baking chocolate chip cookies, all the ingredients are added together, mixed in a bowl, and baked in the oven. The oven provides the energy needed for a chemical reaction to occur. Does the Sun or sky provide energy in photosynthesis? Give students time to respond. Yes! The Sun's light provides the energy needed for the chemical reaction of photosynthesis to occur. Let's continue reading to learn more about photosynthesis!

reading after "After a certain amount...".

Wow! Did you know the process of baking chocolate chip cookies is a lot like photosynthesis? Give students time to respond. What do plants take in during the process of photosynthesis? Give students time to respond. Correct! During photosynthesis, plants take in water, carbon dioxide, and sunlight. At the end of the photosynthesis process, what do plants produce? Give students time to respond. **Correct! Plants produce** sugar in the form of glucose and oxygen. When baking chocolate chip cookies, all the ingredients are added together, mixed in a bowl, and baked in the oven. The oven provides the energy needed for a chemical reaction to occur. What ingredient provides energy in photosunthesis? Give students time to respond. Yes! The Sun's light provides energy. Let's continue

reading to learn more

about photosynthesis!

Continue to use the Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet, (from Segment 1) the Yes/No Cards, and the teacher's copy of the Photosynthesis Full Image Worksheet Lv 2/3 to support students.

# Let's keep reading. Then you will answer questions.

After reading each section, hold up two Picture Cards when applicable, one correct and a distractor. Have students take turns identifying the correct Picture Card. Then, have students take turns answering the comprehension questions using their Yes/ No Card.

Start from "Just as different ingredients..." and stop after "Plant leaves also take...".

Touch [reactants]. Are the ingredients that plants need to perform photosynthesis called products or reactants? (The ingredients needed to perform a chemical reaction are called reactants.)

Is water a reactant needed for the process of photosynthesis? (Yes. The reactants needed for photosynthesis are water, carbon dioxide, and sunlight.)

Do plant leaves take in water? (No. Plants take in water through their roots.)

Do plant flowers capture carbon dioxide and the Sun's energy? (No. Plant

Use the Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1). Have students continue to reference the Photosynthesis Full Image Worksheet Ly 2/3, as needed.

After each comprehension question, when applicable, place three Picture Cards on the table, one correct and two distractors. Have students take turns identifying the correct Picture Card for each applicable comprehension question.

# Let's keep reading. Then you will answer comprehension questions.

Choose a student to read or, if more appropriate, continue to read aloud for students. Encourage students to follow along on their copy using their finger. Assist students as needed.

Start from "Just as different ingredients..." and stop after "Plant leaves also take...".

Are the ingredients that plants need to perform photosynthesis called products or reactants? (Reactants. These are the ingredients needed for a chemical reaction to occur.)

What is one of the reactants needed for photosynthesis? (The reactants needed for photosynthesis are water, carbon dioxide, and sunlight.)

Do the roots or the leaves of a plant take in water?

Use the Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1). Have students continue to reference the Photosynthesis Full Image Worksheet Ly 2/3, as needed.

Let's keep reading.
Then you will answer
comprehension questions.

Choose a student to read or, if more appropriate, continue to read aloud for students. Encourage students to follow along in their copy using their finger. Assist students as needed.

Start from "Just as different ingredients..." and stop after "Plant leaves also take...".

What are the ingredients called that plants need to perform photosynthesis? (Reactants. These are the ingredients needed for a chemical reaction to occur.)

# What are the reactants needed for photosynthesis?

(The reactants needed for photosynthesis are water, carbon dioxide, and sunlight.)

What part of the plant takes in water? (Plants take in water through their roots.)

What part of the plant captures carbon dioxide and the Sun's energy? (Plant leaves capture carbon dioxide and the Sun's energy.)

**Let's keep reading.** Start from "The cells in a..." and stop after "This is how carbon...".

leaves capture carbon dioxide and the Sun's energy.)

Let's keep reading. Start from Start from "The cells in a..." and stop after "This is how carbon...".

[Touch chloroplast]. Do cells in a plant's leaves contain chloroplasts? (Yes. The cells in a plant's leaves contain organelles called chloroplasts.)

# Is an organelle a cell part with a specific function?

(Yes. An organelle is a part of a cell that has a specific function. Chloroplasts are organelles in plant cells.)

Is the organelle where photosynthesis occurs called stomata? (No. The chloroplast is the location where photosynthesis occurs. Chloroplasts are the containers that hold all the ingredients needed for photosynthesis.)

We put all the ingredients in a bowl when baking cookies. Are chloroplasts the "bowl" in photosynthesis? (Yes. The chloroplast is the "bowl" or container in the process of photosynthesis.)

Touch [chlorophyll]. Is chlorophyll a red pigment inside the chloroplast? (No. Chlorophyll is a green pigment inside the chloroplast.)

Does chlorophyll absorb the Sun's light energy? (Yes. Chlorophyll absorbs light energy from the Sun and gives

(continued)

plants their green color.)

(Plants take in water through their roots.)

Do plant leaves or flowers capture carbon dioxide and the Sun's energy? (The plant leaves capture carbon dioxide and the Sun's energy.)

Let's keep reading. Start from Start from "The cells in a..." and stop after "This is how carbon...".

Do the cells in a plant's leaves contain roots or **chloroplasts?** (The cells in a plant's leaves contain organelles called chloroplasts.)

Is an organelle a part of a cell with a specific function or a part of a cell with no function? (An organelle is a part of a cell that has a specific function.)

Is the organelle where photosynthesis occurs called stomata or chloroplast? (Chloroplast. The chloroplast is the container that holds all the ingredients needed for photosynthesis.)

When baking cookies, we put all the ingredients in a bowl. What is the "bowl" in photosynthesis? (The chloroplast is the "bowl" in the process of photosynthesis.)

Is chlorophyll a red or green pigment inside the chloroplast? (Chlorophyll is a green pigment inside the chloroplast.)

Does chlorophyll absorb light energy or block light energy? (Chlorophyll absorbs (continued)

What do the cells in a plant's leaves contain? (The cells in a plant's leaves contain organelles called chloroplasts.)

What is an organelle? (An organelle is a part of a cell that has a specific function.)

What is the name of the organelle where photosynthesis occurs?

(Chloroplast. The chloroplast is the container that holds all the ingredients needed for photosynthesis.)

What is the chloroplast in the baking analogy? (The chloroplast is the bowl in the baking analogy.)

What is inside the chloroplast? (Chlorophyll is a green pigment inside the chloroplast.)

What does chlorophyll do? (Chlorophyll absorbs light energy from the Sun and gives plants their green color.)

What are structures on plant leaves called? (Stomata. Stomata are small pores that open and close.)

What enters and exits through the stomata?

(Gases like oxygen exit through the stomata. Carbon dioxide enters through the stomata.)

Let's keep reading. Start from "Think of our baking..." and stop after "Other organisms use oxygen...".

What provides the energy for the chemical reaction of baking cookies? (The oven.)

(continued)

Are structures on plant leaves that open and close called stomata? (Yes. Stomata are small pores on plant leaves that open and close.)

Touch [oxygen]. Do gases enter and exit through the stomata? (Yes. Gases like oxygen exit through the stomata. Oxygen is a natural, colorless, odorless gas produced during photosynthesis.)

**Let's keep reading.** Start from "Think of our baking..." and stop after "Other organisms use oxygen...".

The oven provides the energy for the chemical reaction of baking cookies. Is the oven compared to water in the process of photosynthesis? (No. The oven is compared to sunlight. Sunlight provides the energy needed for the chemical reaction of photosynthesis to occur.)

Touch [product]. Is a product formed when a chemical reaction occurs?

(Yes. A product is something that is formed or created at the end of a chemical reaction.)

Touch [photosynthesis]. Is carbon dioxide a product of photosynthesis? (No. A plant produces sugar in the form of glucose and oxygen during photosynthesis.)

Do plants use glucose for energy to perform life functions? (Yes.)

light energy from the Sun and gives plants their green color.)

Are structures on plant leaves that open and close called stomata or chloroplast? (Stomata. Stomata are small pores on plant leaves that open and close.)

Does sugar or gases enter and exit through the stomata? (Gases like oxygen exit through the stomata. Carbon dioxide gas enters through the stomata.)

**Let's keep reading.** Start from "Think of our baking..." and stop after "Other organisms use oxygen...".

Does the oven or the bowl provide the energy for the chemical reaction of baking cookies? (The oven.)

The oven provides the energy for the chemical reaction of baking cookies. Is the oven compared to water or sunlight in the process of photosynthesis? (The oven is compared to sunlight. Sunlight provides the

(The oven is compared to sunlight. Sunlight provides the energy needed for the chemical reaction of photosynthesis to occur.)

Is a product or reactant formed when a chemical reaction occurs? (A product is something that is formed or created at the end of a chemical reaction.)

What is one of the products of photosynthesis? (A plant produces sugar in the form of glucose and oxygen during photosynthesis.)

What is the oven compared to in the process of photosynthesis? (The oven is compared to sunlight. Sunlight provides the energy needed for the chemical reaction of photosynthesis to occur.)

What is formed when the chemical reaction occurs? (The product is formed.)

What are the products of photosynthesis? (A plant produces sugar in the form of glucose and oxygen.)

What do plants use glucose for? (Plants use glucose as their energy source to perform life functions.)

What is a waste product of photosynthesis? (Plants release oxygen through their stomata.)

Is oxygen used by other organisms? (Yes. Oxygen is used by many other organisms in their life processes.)

Let's keep reading.
Start from "Oxygen is considered a..." and stop after "Photosynthesis is essential for...".

Is oxygen important? (Yes. Even though oxygen is a waste product of photosynthesis, it is needed for many organisms to survive.)

Do you think photosynthesis is essential to life on Earth? (Yes. The process of photosynthesis provides oxygen, which is necessary for life.)

students time to respond.

Great job! [Photosynthesis is the process where a green plant takes in water and carbon dioxide to make food (sugar) and oxygen when the plant is exposed to light.]

Repeat this procedure for the remaining Picture Cards. Describe the image(s) on each Picture Card.

You may either have one student complete all trials and then move on to the next student, or you may have each student take one or two turns at a time.

Use System of Least Prompts Individual (per student) or Group Data Sheet to collect data. Encourage students to use the information written on the Magnetic Whiteboard and Photosynthesis Full Image Worksheet Ly 2/3 as needed.

Now it's your turn. Cut out the Picture Cards on the worksheet. Assist students as needed with cutting apart the Picture Cards or cut these out for students before the lesson.

There are four columns on the worksheet. Point to each column on the Magnetic Whiteboard and read each title. Place three Picture Cards in front of the student, one correct and two distractors.

Does the statement [Water is needed for photosynthesis] describe a reactant, a product, plant leaves or roots, or cell organelles or structures?

Give students time to respond. After the student has responded, assist the student as needed with placing the Picture Card in the correct column on the worksheet.

Repeat this procedure for the remaining Picture Cards until all have been sorted correctly on the worksheet.

After students are done, check their work and have them glue the Picture Cards on the worksheet.

If the completed worksheet does not provide enough data, use System of Least Prompts Individual (per student) or Group Data Sheet to collect additional data as needed. the Magnetic Whiteboard and Photosynthesis Full Image Worksheet Lv 2/3 as needed.

Now it's your turn. Cut out the Picture Cards on the worksheet. Assist students as needed with cutting apart the Picture Cards or cut these out for students before the lesson.

Today we are going to sort the Picture Cards based on what they describe. There are four columns on the worksheet. Point to each column and read each title. First, read and look at each Picture Card. Next, decide if the Picture Card describes a reactant, a product, plant leaves or roots, or cell organelles or structures. Then, place the Picture Card in the correct column. Assist students as needed.

After students are done, check their work and have them glue the Picture Cards on the worksheet.

Provide each student with a Photosynthesis Reading Comprehension Questions Worksheet Lv 3 and a pencil. Place the teacher's copy on the Magnetic Whiteboard.

Now it's your turn. Read each question and use what you have learned to answer the questions. Have additional notebook paper available for students if they need more space to write. Model writing sample sentences on the teacher's copy.

	LEVEL 1	LEVEL 2	LEVEL 3
			Check students' work. Have students share answers or review the correct answers.  If the completed worksheets do not provide enough data, use System of Least Prompts Individual (per student) or Group Data Sheet to collect additional data as needed.
PROMPTING AND ERROR CORRECTION	Verbal Prompt: Touch [photosynthesis].  Model Prompt: Watch me. Point to the correct Picture Card. [Photosynthesis is the process where a green plant takes in water and carbon dioxide to make food (sugar) and oxygen when the plant is exposed to light.] Your turn.  Physical Prompt: Do it with me. This is [photosynthesis]. Use hand-over-hand guidance and physically prompt the student to touch the [photosynthesis] Picture Card.	Verbal Prompt: Does the statem photosynthesis] describe a releaves or roots, or cell organs Model Prompt: Watch me. Point is needed for photosynthesis] Your turn.  Physical Prompt: Do it with me. photosynthesis] describes a [reguidance and physically prompt the is needed for] Picture Card in the worksheet.	actant, a product, plant elles or structures? to the correct column. [Water describes a [reactant].  [Water is needed for reactant]. Use hand-over-hand he student to place the [Water
REINFORCE	Great job! You identified the key vocabulary words and learned more about photosynthesis.	Excellent job! You sorted the learned about in the Compan photosynthesis and compared cookies.	ion Text. We learned about



# Instructional Tip!

- At the end of the lesson segment, put each student's Definition and Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet into a small plastic bag for use in subsequent lesson segments.
- At the end of the lesson segment, keep teacher's copy and each Lv 2 and 3 student's copy of the Photosynthesis Full Image Worksheet for use in Segment 3.



# **Connecting the Big Ideas**

# **Learning Objectives**

• Identify the products and function of photosynthesis.

### **Materials**

- Print the following worksheets and data sheets:
  - Unit 93 Lesson 1 SCI Photosynthesis
     Writing Worksheet Lv 2 (per Level 2 student and teacher)
  - Unit 93 Lesson 1 SCI Photosynthesis
     Summary Worksheet Lv 3 (per Level 3 student and teacher)
  - Unit 93 Lesson 1 SCI Photosynthesis Full Image Worksheet Lv 2/3 (print new copy or use copy from Segment 2)
  - Unit 93 Lesson 1 SCI Photosynthesis
     Definition and Picture Cards
     Worksheet (print new copy or use copy from Segment 1)
  - Classroom Resources Yes/No Cards Worksheet (per Level 1 student)
  - Constant Time Delay Individual (per student) or Group Data Sheet

- System of Least Prompts Individual (per student) or Group Data Sheet
- Gather the following materials from the enCORE Manipulatives Kit and/or your classroom:
  - Unit 93 Lesson 1 Science Companion Text
     e-Reader (with icons)
  - Unit 93 Lesson 1 Science Companion Text
     e-Reader (without icons)
  - Magnetic Whiteboard
  - Magnetic Picture Pockets
  - Dry erase marker
  - Scissors (per Level 2 student)
  - Glue (per Level 2 student)
  - Pencil (per Level 3 student)
  - Notebook paper, if needed (per Level 3 student)

#### **Prior to Instruction**

To prepare for teaching this lesson segment, follow these steps:

- 1. Gather, print, and prepare all materials listed to the right.
- 2. If you plan to program students' AAC devices, program the following words:

LEVEL 1	LEVEL 2	LEVEL 3
<ul> <li>vocabulary words         (photosynthesis, chloroplast, chlorophyll, reactants, oxygen, products)     </li> </ul>	<ul> <li>vocabulary words         (photosynthesis, chloroplast, chlorophyll, reactants, oxygen, products)     </li> </ul>	<ul> <li>vocabulary words         (photosynthesis, chloroplast, chlorophyll, reactants, oxygen, products)     </li> </ul>

LEVEL 1	LEVEL 2	LEVEL 3
<ul><li>plant</li><li>water</li><li>carbon dioxide</li><li>sunlight</li></ul>	<ul><li>plant</li><li>water</li><li>carbon dioxide</li><li>sunlight</li></ul>	<ul><li>plant</li><li>water</li><li>carbon dioxide</li><li>sunlight</li></ul>

### **Anchor Instruction for All Students**

Prior to beginning instruction, anchor instruction by referencing the Companion Text Unit 93 Lesson 1 Science Companion Text. This week, we have been reading Unit 93 Lesson 1 Science Companion Text. The subtitle of this companion text is Photosynthesis. While reading, we learned how plants use water, carbon dioxide, and sunlight to perform photosynthesis. Hold up the teacher's copy of the Photosynthesis Full Image Worksheet Lv 2/3 for students to reference. What are the products of photosynthesis? Give students time to respond. Repeat correct answers. That's right! Plants produce sugar, in the form of glucose, and oxygen. Let's keep reading to learn more!

# **Core Vocabulary and Concepts**

In this section, introduce the vocabulary listed below using either Constant Time Delay or System of Least Prompts. For details on these instructional methods, see the Core Vocabulary and Concepts Instructional Methods section at the front of this Teacher's Guide or access the Core Vocabulary and Concepts Instructional Methods resources under Resources > Instructional Methods on the enCORE 9-12 web-based application.

Materials: *Unit 93 Lesson 1 SCI* Photosynthesis Definition and Picture Cards Worksheet (use copy from Segment 1), Constant Time Delay Individual (per student) or Group Data Sheet, System of Least Prompts Individual (per student) or Group Data Sheet, Magnetic Whiteboard, Magnetic Picture Pockets

**Prior to Instruction:** Select instructional method (i.e., Constant Time Delay or System of Least Prompts). Then, prepare the corresponding individual or group data sheet to collect data on your students as you teach the vocabulary below. Place all the cards from the Photosynthesis Definition and Picture Cards Worksheet into the Magnetic Picture Pockets. Place the Definition Cards on the left side of the Magnetic Whiteboard. Place the Picture Cards on the right side of the Magnetic Whiteboard.

VOCABULARY WORD	DEFINITION	LEVELS
photosynthesis	the process where a green plant takes in water and carbon dioxide to make food (sugar) and oxygen when the plant is exposed to light	1, 2, 3
chloroplast	the location where plant cells make their own food (photosynthesis)	1, 2, 3
chlorophyll	a green substance inside the chloroplast that absorbs light energy during photosynthesis	1, 2, 3
reactants	the ingredients needed for a chemical reaction to occur	1, 2, 3
oxygen	a natural, colorless, odorless gas produced during photosynthesis	1, 2, 3

VOCABULARY WORD	DEFINITION	LEVELS
products	something that is created at the end of a chemical reaction	1, 2, 3

# Read and Connect the Big Ideas

Materials: Unit 93 Lesson 1 Science Companion Text e-Reader (with icons), Unit 93 Lesson 1 Science Companion Text e-Reader (without icons), Unit 93 Lesson 1 SCI Photosynthesis Writing Worksheet Lv 2 (per Level 2 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis Summary Worksheet Lv 3 (per Level 3 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis Full Image Worksheet Lv 2/3 (print new copy or use the copy from Segment 2), Unit 93 Lesson 1 SCI Photosynthesis Definition and Picture Cards Worksheet (print new copy or use the copy from Segment 1), Classroom Resources Yes/No Cards Worksheet (per Level 1 student), System of Least Prompts Individual (per student) or Group Data Sheet, Magnetic Whiteboard, Magnetic Picture Pockets, dry erase marker, scissors (per Level 2 student), glue (per Level 2 student), pencil (per Level 3 student), notebook paper, if needed (per Level 3 student)

**Prior to Instruction:** Have the *Unit 93 Lesson 1 Science Companion Text* e-Reader on the classroom interactive board to use with students. Reuse the Definition and Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1) and the Photosynthesis Full Image Worksheet Lv 2/3 (from Segment 2) for all students. Place all the cards in Magnetic Picture Pockets. On the Magnetic Whiteboard, write the vocabulary words: photosynthesis, chloroplast, chlorophyll, reactants, oxygen, and products. Below each vocabulary word, write a brief description (i.e., photosynthesis is the process where green plants make food and oxygen when exposed to light).

	LEVEL 1	LEVEL 2	LEVEL 3
INTRODUCE	Have Unit 93 Lesson 1 Science Companion Text e-Reader (with icons) ready to use with students on the classroom interactive board. Today we are going to use the Unit 93 Lesson 1 Science Companion Text e-Reader. Let's continue to learn about photosynthesis. Have students listen to the full reading of Unit 93 Lesson	Have Unit 93 Lesson 1 Science Companion Text e-Reader (with icons) ready to use with students on the classroom interactive board. Today we are going to use the Unit 93 Lesson 1 Science Companion Text e-Reader. Let's continue to learn about photosynthesis. Have students listen to the full reading of Unit 93 Lesson	Have Unit 93 Lesson 1 Science Companion Text e-Reader (without icons) ready to use with students on the classroom interactive board. Today we are going to use the Unit 93 Lesson 1 Science Companion Text e-Reader. Let's continue to learn about photosynthesis. Have students listen to the full reading of Unit 93 Lesson
	1 Science Companion Text e-Reader (with icons).	1 Science Companion Text e-Reader (with icons).	1 Science Companion Text e-Reader (without icons).
MODEL	Watch me read a page and pull up the question(s) to answer. On the Unit 93 Lesson 1 Science Companion Text e-Reader (with icons), read the page aloud.  After the section on the	Provide students the Photosynthesis Full Image Worksheet Lv 2/3 (from Segment 2) to use as reference.  Watch me read a page and pull up the question(s) to answer. On the Unit 93 Lesson	Provide students the Photosynthesis Full Image Worksheet Lv 2/3 (from Segment 2) to use as reference.  Watch me read a page and pull up the question(s) to answer. On the Unit 93 Lesson
	e-Reader is read, select the	1 Science Companion Text	1 Science Companion Text

#### LEVEL 1 LEVEL 2 LEVEL 3 closed captions (CC) to review e-Reader (with icons), read the e-Reader (without icons), read question(s) with the students. the page aloud. page aloud. Hold up two Picture Cards After the section on the After the section on the from the Photosynthesis e-Reader is read, select the e-Reader is read, select the Definition and Picture Cards closed captions (CC) to review closed captions (CC) to review question(s) with the students. Worksheet (from Segment question(s) with the students. 1), one correct and one Place three Picture Cards Refer to the information on distractor. Model how to from the Photosynthesis the Magnetic Whiteboard answer the question(s) for Definition and Picture and the Photosynthesis Full students. Use the teacher's Cards Worksheet (from Image Worksheet Lv 2/3 (from copy of the Photosynthesis Segment 1) on the table, one Segment 2) to model how to Full Image Worksheet Lv 2/3 correct and two distractors. answer the question(s) for (from Segment 2) for additional students. Model how to answer the support. question(s) for students. Refer to the information on the Maanetic Whiteboard and the Photosynthesis Full Image Worksheet Lv 2/3 (from Segment 2) for additional support. Let's keep reading. Read Let's keep reading. Call on a Let's keep reading. Call on a

Let's keep reading. Read aloud or have the e-Reader read aloud the next section on *Unit 93 Lesson 1 Science Companion Text* e-Reader (with icons).

After each section on the e-Reader is read, select the closed captions (CC) to review question(s) with the students. Read or have the e-Reader read the question(s).

Hold up two Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1), one correct and one distractor.

Touch [name of correct Picture Card]. Give each student a turn to answer the question(s). Continue to use the teacher's copy of the Photosynthesis Full Image

(continued)

Let's keep reading. Call on a student to read the next page aloud or have the e-Reader read aloud the next section on Unit 93 Lesson 1 Science Companion Text e-Reader (with icons).

After each section on the e-Reader is read, select the closed captions (CC) to review question(s) with the students. Read, have a student read, or have the e-Reader read the question(s). Then, place three Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1) on the table, one correct and two distractors.

Find [name of correct Picture Card]. Give each student a turn to answer the question(s). Encourage students to continue to use

(continued)

Let's keep reading. Call on a student to read the next page aloud or have the e-Reader read aloud the next section on Unit 93 Lesson 1 Science Companion Text e-Reader (without icons).

After each section on the e-Reader is read, select the closed captions (CC) to review question(s) with the students. Read, have a student read, or have the e-Reader read the question(s). Give each student a turn to answer the question(s). Assist students as needed by referring to the information written on the Magnetic Whiteboard and the Photosynthesis Full Image Worksheet Lv 2/3 (from Segment 2).

Repeat this procedure for the questions in the remaining

(continued)

	LEVEL 1	LEVEL 2	LEVEL 3
	Worksheet Lv 2/3 (from Segment 2) for additional support. Repeat this procedure for the questions in the remaining sections on <i>Unit 93 Lesson 1 Science Companion Text</i> e-Reader (with icons).	the Photosynthesis Full Image Worksheet Lv 2/3 (from Segment 2) for additional support. Repeat this procedure for the questions in the remaining sections on Unit 93 Lesson 1 Science Companion Text e-Reader (with icons).	sections on Unit 93 Lesson 1 Science Companion Text e-Reader (without icons).
INDEPENDENT PRACTICE	Continue using the Definition and Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1) and the teacher's copy of the Photosynthesis Full Image Worksheet Lv 2/3 (from Segment 2).  Provide each student a set of Yes/No Cards from the Yes/No Cards Worksheet. Tell students to use their Yes/No Cards.  Wait for the student to respond by holding up or gesturing towards a Yes/No Card.  Now it's your turn. Place two Picture Cards in front of the student, one correct and one distractor. Touch the [chloroplast] Picture Card. Correct! You touched [chloroplast]. Pick up the Definition Card, hold it next to the Picture Card, and read the definition.  Is the chloroplast located in the leaves of a plant.)  Is the chloroplast where photosynthesis occurs? (Yes.)  Repeat this procedure for the remaining cards. Ask questions based on the images(s) on the Picture Card and the Definition.	Provide each student with the Photosynthesis Writing Worksheet Lv 2, scissors, and glue.  Now it's your turn. Cut out the Picture Cards on the worksheet. Assist students as needed with cutting apart the Picture Cards or cut these out for students before the lesson.  We are going to fill in the missing words in the sentence to make a paragraph explaining what we learned about photosynthesis. Place three Picture Cards in front of the student, one correct and two distractors. Find the Picture Card with the missing word in each sentence. [Plants take in water, carbon dioxide, and during photosynthesis. These ingredients are called reactants.]. Give students time to respond. Assist students as needed with reading each sentence.  Encourage students to reference the information on the Magnetic Whiteboard and the Photosynthesis Full Image Worksheet Lv 2/3 (from Segment 2) as needed.	Provide each student with the Photosynthesis Summary Worksheet Lv 3 and a pencil. Have additional notebook paper available for students as needed.  Place the Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1) on the table for students to reference.  Encourage students to reference the information on the Magnetic Whiteboard and the Photosynthesis Full Image Worksheet Lv 2/3 (from Segment 2) as needed.  Now it's your turn. Read each question. Use what you have learned about photosynthesis to answer the questions. Assist students as needed with reading each question.  At the bottom of your worksheet, there is a summary section. Write three to five sentences summarizing the different plant parts that capture the reactants needed for the process of photosynthesis. Have additional notebook paper available for students if they need more space to write.

	LEVEL 1	LEVEL 2	LEVEL 3
	You may either have one student complete all trials and then move on to the next student, or you may have each student take one to two turns at a time.  Use System of Least Prompts Individual (per student) or Group Data Sheet to collect data.	Repeat this procedure for each sentence. Assist students as needed.  After students are done, check their work and have them glue the Picture Cards onto the worksheet.  If the completed worksheet does not provide enough data, use System of Least Prompts Individual (per student) or Group Data Sheet to collect additional data as needed.	Model writing sample sentences on the teacher's copy of the worksheet.  Check students' work. Have students share answers or review the correct answers.  If the completed worksheet does not provide enough data, use System of Least Prompts Individual (per student) or Group Data Sheet to collect additional data as needed.
PROMPTING AND ERROR CORRECTION	Verbal Prompt: Touch [chloroplast].  Model Prompt: Watch me. Point to the [chloroplast] Picture Card. The [chloroplast is the location where plant cells make their own food in photosynthesis].  Physical Prompt: Do it with me. This is the [chloroplast]. Use hand-over- hand guidance and physically prompt the student to touch the [chloroplast] Picture Card.	Verbal Prompt: Find the Picture Card for the missing word in each sentence. [Plants take in water, carbon dioxide, and during photosynthesis. These ingredients are called reactants.]  Model Prompt: Watch me Point to [sunlight] Picture Card. [Plants take in water, carbon dioxide, and during]. Your turn.  Physical Prompt: Do it with me. [Plants take in water, carbon dioxide, and during]. Use hand-over- hand guidance and physically prompt the student to place the [sunlight] Picture Card in the missing blank to complete the sentence on the worksheet.	Verbal Prompt: Write a summary about [the different plant parts used to capture the reactants (water, carbon dioxide, sunlight) needed for the process of photosynthesis].  Model Prompt: Watch me. On the teacher's copy on the Magnetic Whiteboard write, [Plants take in water].  Your turn.  Physical Prompt: Do it with me. Point to the student's paper. Write [Plants take in water]. Use hand-overhand guidance and physically prompt the student to write [Plants take in water] on the worksheet.
REINFORCE	Great work! You identified key vocabulary terms and answered questions about them.	Excellent job! You filled in the missing word to complete the sentences that summarized what we learned from Unit 93 Lesson 1 Science Companion Text e-Reader, Photosynthesis.	Terrific work! You answered questions and summarized what we learned from Unit 93 Lesson 1 Science Companion Text e-Reader, Photosynthesis.

Instructional Tip! At the end of the lesson segment, put each student's Definition and Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet into a small plastic bag for use in subsequent lesson segments.



# Investigate and Extend

# **Learning Objectives**

- Recognize that the function of photosynthesis is to produce food for plants.
- Recognize that plants need water, light, and air to grow.

### **Materials**

- Print the following worksheets and data sheets:
  - Unit 93 Lesson 1 SCI Photosynthesis
     Sorting 2 Worksheet Lv 2/3 (per Level 2 and 3 student and teacher)
  - Unit 93 Lesson 1 SCI Photosynthesis Task Analysis Worksheet
  - Unit 93 Lesson 1 SCI Photosynthesis
     Labeling Worksheet Lv 2/3 (per Level 2 and 3 student and teacher)
  - Unit 93 Lesson 1 SCI Photosynthesis
     Definition and Picture Cards
     Worksheet (print new copy or use copy from Segment 1)
  - Classroom Resources Yes/No Cards
     Worksheet (per Level 1 student)
  - Constant Time Delay Individual (per student) or Group Data Sheet
  - System of Least Prompts Individual (per student) or Group Data Sheet

- Gather the following materials from the enCORE Manipulatives Kit and/or your classroom:
  - Magnetic Whiteboard
  - Magnetic Picture Pockets
  - Dry erase marker
  - Scissors (per Level 2 and 3 student)
  - Glue (per Level 2 and 3 student)
  - Таре
  - Permanent marker
  - Saplings (2)
  - Small pots (6)
  - Potting soil
  - Umbrella
  - Water
  - Bean seeds (4)
  - Clear plastic cups or bowls (2)
  - Fresh plant leaves (2)
  - Small rocks (2)

### **Prior to Instruction**

To prepare for teaching this lesson segment, follow these steps:

- 1. Gather, print, and prepare all materials listed to the right.
- 2. If you plan to program students' AAC devices, program the following words:

LEVEL 1	LEVEL 2	LEVEL 3
<ul> <li>vocabulary words (photosynthesis, chloroplast, chlorophyll, reactants, oxygen, products)</li> <li>plant</li> <li>water</li> <li>carbon dioxide</li> <li>sunlight</li> </ul>	<ul> <li>vocabulary words (photosynthesis, chloroplast, chlorophyll, reactants, oxygen, products)</li> <li>plant</li> <li>water</li> <li>carbon dioxide</li> <li>sunlight</li> </ul>	<ul> <li>vocabulary words         (photosynthesis, chloroplast,         chlorophyll, reactants,         oxygen, products)</li> <li>plant</li> <li>water</li> <li>carbon dioxide</li> <li>sunlight</li> </ul>

### **Anchor Instruction for All Students**

Prior to beginning instruction, anchor instruction by referencing the Companion Text Unit 93 Lesson 1 Science Companion Text. This week, we have been reading Unit 93 Lesson 1 Science Companion Text. The subtitle of this companion text is Photosynthesis. We have learned a lot about the reactants, products, and purpose of photosynthesis. Plants need water, carbon dioxide, and sunlight to grow. At the end of the process, glucose and oxygen are produced. What is the function of photosynthesis? Give students time to respond. Student answers will vary. Repeat correct responses. That's right! The function of photosynthesis is to produce food for plants.

# **Core Vocabulary and Concepts**

In this section, introduce the vocabulary listed below using either Constant Time Delay or System of Least Prompts. For details on these instructional methods, see the Core Vocabulary and Concepts Instructional Methods section at the front of this Teacher's Guide or access the Core Vocabulary and Concepts Instructional Methods resources under Resources > Instructional Methods on the enCORE 9-12 web-based application.

Materials: Unit 93 Lesson 1 SCI Photosynthesis Definition and Picture Cards Worksheet (use copy from Segment 1), Constant Time Delay Individual (per student) or Group Data Sheet, System of Least Prompts Individual (per student) or Group Data Sheet, Magnetic Whiteboard, Magnetic Picture Pockets

**Prior to Instruction:** Select instructional method (i.e., Constant Time Delay or System of Least Prompts). Then, prepare the corresponding individual or group data sheet to collect data on your students as you teach the vocabulary below. Place all the cards from the Photosynthesis Definition and Picture Cards Worksheet into the Magnetic Picture Pockets. Place the Definition Cards on the left side of the Magnetic Whiteboard. Place the Picture Cards on the right side of the Magnetic Whiteboard.

VOCABULARY WORD	DEFINITION	LEVELS
photosynthesis	the process where a green plant takes in water and carbon dioxide to make food (sugar) and oxygen when the plant is exposed to light	1, 2, 3
chloroplast	the location where plant cells make their own food (photosynthesis)	1, 2, 3
chlorophyll	a green substance inside the chloroplast that absorbs light energy during photosynthesis	1, 2, 3

NTRODUCE				
TRODUCE				
TRODU	ĺ	ı	1	
TRODU	Į	Į		
Z T R C				
Ļ	ļ	i		١
5				
Z	ļ	ł		
	į		2	

VOCABULARY WORD	DEFINITION	LEVELS
reactants	the ingredients needed for a chemical reaction to occur	1, 2, 3
oxygen	a natural, colorless, odorless gas produced during photosynthesis	
products	something that is created at the end of a chemical reaction	1, 2, 3

# **Ask Questions and Find Answers**

Materials: Unit 93 Lesson 1 SCI Photosynthesis Sorting 2 Worksheet Lv 2/3 (per Level 2 and 3 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis Task Analysis Worksheet, Unit 93 Lesson 1 SCI Photosynthesis Labeling Worksheet Lv 2/3 (per Level 2 and 3 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis Definition and Picture Cards Worksheet (print new copy or use copy from Segment 1), Classroom Resources Yes/No Cards Worksheet (per Level 1 student), System of Least Prompts Individual (per student) or Group Data Sheet, Magnetic Whiteboard, Magnetic Picture Pockets, dry erase marker, scissors (per Level 2 and 3 student), qlue (per Level 2 and 3 student), tape, permanent marker

Experiment Materials (This list details the quantity of each material needed to perform the experiment one time. Please determine how many experiments will be conducted across levels by both teacher and/ or students to determine the total quantity you will need of each of the materials): 2 saplings, 6 small pots, potting soil, umbrella, water, 4 bean seeds, 2 clear plastic cups or bowls, 2 fresh plant leaves, 2 small rocks

**Prior to Instruction:** Gather all the supplies needed and organize them based on the experiment. Some materials may be used in multiple experiments (i.e., potting soil is used in two experiments). Reuse the Definition and Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1). Place all the cards in Magnetic Picture Pockets. On the Magnetic Whiteboard, write the vocabulary words: photosynthesis, chloroplast, chlorophyll, reactants, oxygen, and products. Below each vocabulary word, write a brief description (i.e., photosynthesis is the process where green plants make food and oxygen when exposed to light). Use for additional support with Level 2 and 3 students.

LEVEL 1 LEVEL 2 LEVEL 3

Today we are going to take a closer look at what plants need to grow and perform photosynthesis: water, sunlight, and carbon dioxide. Before we begin, let's review and learn more about the reactants and products of photosynthesis! Are products the ingredients needed for a chemical reaction to occur? Give students time to respond. Correct! No. Reactants are the ingredients needed for a chemical reaction to occur. A product is something that is created at the end of a chemical reaction. Does photosynthesis occur inside the chloroplast or inside mitochondria? Give students time to respond. Good job! Photosynthesis occurs inside the chloroplast. Plant chloroplasts are organelles that contain a green pigment called chlorophyll. During the process of photosynthesis, does chlorophyll absorb light energy? Give students time to respond. Good job! Yes, chlorophyll is located inside the chloroplast and absorbs light energy during photosynthesis. There are different reactants needed for photosynthesis to take place. Let's review the reactants and products of photosynthesis, and then we will perform three experiments to learn more about the process of photosynthesis.

Use the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1).

Provide each student a set of Yes/No Cards from the Yes/No Cards Worksheet. Tell students to use their Yes/No Cards. Wait for the student to respond by holding up or gesturing towards a Yes/No Card.

Hold up the [reactants] Picture Card. Is water a reactant for photosynthesis? (Yes. Water is a reactant.)

**Is oxygen a reactant for photosynthesis?** (No. Oxygen is a product of photosynthesis.)

Is sunlight a reactant for photosynthesis? (Yes. Sunlight is a reactant.)

Sunlight, water, and carbon dioxide are the reactants needed for photosynthesis to occur.

Repeat the procedure above for the [products] Picture Card. Ask questions to ensure student understanding. Provide each student with a Photosynthesis Sorting 2 Worksheet Lv 2/3. Place the teacher's copy on the Magnetic Whiteboard.

Let's review the reactants and products of photosynthesis. Cut out the Picture Cards on the worksheet. Assist the students as needed or cut apart the Picture Cards before the lesson. There are two columns on the worksheet. Point to each column on the worksheet (teacher's copy) on the Magnetic Whiteboard and read each title. As a class, we are going to first read each Picture Card. Next, we will decide if the Picture Card describes a reactant or a product. Then, we will place the Picture Card in the correct column on the worksheet. Assist students as needed.

Let's do these together. Find a Picture Card that describes [reactants.] Place three Picture Cards in front of the student, one [water], and two distractors. Give students time to respond. After the student has responded, assist the student as needed with placing the Picture Card in the correct column on the worksheet.

Repeat this procedure for the remaining Picture Cards, until all have been sorted correctly on the worksheet.

After students are done, check their work and have them glue the Picture Cards on the worksheet.

Wow! We learned that the reactants of photosynthesis are water, carbon dioxide, and sunlight. The products of photosynthesis are oxygen and glucose or sugar.

Level 1: Provide each student a set of Yes/No Cards from the Yes/No Cards Worksheet. Tell students to use their Yes/No Cards. Wait for the student to respond by holding up or gesturing towards a Yes/No Card. Place the teacher's copy of the Photosynthesis Task Analysis Worksheet on the Magnetic Whiteboard. Throughout the Task Analysis Worksheet, when applicable, reword the questions to ask Yes/No questions.

Level 2 and 3: Provide each student with a Photosynthesis Task Analysis Worksheet. Place the teacher's copy on the Magnetic Whiteboard.

We are going to perform three experiments relating to the process of photosynthesis. The first two experiments will help us better understand the reactants needed for photosynthesis, while the last experiment will help us better understand the products of photosynthesis. Let's get started!

Plants, Water, and Sunlight:

Gather the following materials: 2 saplings, 2 small pots, potting soil, an umbrella, tape, a permanent marker, and water. This activity should be completed as a demonstration for all levels. Read and follow the directions on the worksheet. Discuss what was observed.

MODEL

### Plants, Water, and Sunlight Questions:

- 1. Plant A did not change in comparison to Plant B. The leaves of Plant A did not wilt because the Sun did not shine directly on the soil, which helped the soil stay damp. In Plant A, less water evaporated from the soil, so the plant leaves did not wilt as much. The soil remained damp and moist. Adding shade can help keep plants healthy.
- 2. The leaves of Plant B wilted under full sunlight. The Sun's heat caused the soil to become dry.
- 3. The reactants needed for photosynthesis to occur are an appropriate amount of water, sunlight, and carbon dioxide.
- 4. Plants take in water through their roots.

# Wow! We learned that water is necessary for plants to survive and perform photosynthesis. Let's do another experiment!

#### Plants and Sunlight:

Gather the following materials: 4 bean seeds, 4 small pots, potting soil, tape, a permanent marker, and water. This activity should be completed as a demonstration for Level 1 students and can be completed as a model first and then in small groups for Level 2 and 3 students. Read and follow the directions on the worksheet. Discuss what was observed.

#### Plants and Sunlight Questions:

- 1. Plants A and B sprouted in the sunlight. These plants had all the ingredients (reactants) needed to grow. Plants A and B received water, sunlight, and carbon dioxide.
- 2. Plants C and D did not grow. They did not have the ingredients (reactants) needed to grow. Plants C and D received water and carbon dioxide, but no sunlight.
- 3. This demonstration shows that plants need water, sunlight, and carbon dioxide to grow and perform photosynthesis. We know this because Plants C and D did not receive sunlight and did not grow.

# Wow! We learned that sunlight is necessary for plants to survive and perform photosynthesis. Let's do one more experiment.

#### Products of Photosynthesis:

Gather the following materials: 2 clear plastic cups or bowls, 2 fresh plant leaves, water, and 2 small rocks. This activity should be completed as a demonstration for Level 1 students and can be completed as a model first and then in small groups for Level 2 and 3 students. Read and follow the directions on the worksheet. Discuss what was observed. Review the definition of product with the students to ensure understanding.

#### Products of Photosynthesis Questions:

- 1. The products of photosynthesis are glucose (sugar) and oxygen.
- 2. Small air bubbles began to form on the edges of the leaf. When a leaf has the necessary reactants needed for photosynthesis including water, carbon dioxide, and sunlight, it releases oxygen. The leaf in the sunlight produced oxygen in the water. The leaf in the dark was also producing gas. The leaf in the dark released carbon dioxide because it went through cellular respiration due to a lack of sunlight.

(continued)

enC®RE × 93-14

3. The leaf in the sunlight produced a lot of oxygen because when a plant has water, carbon dioxide, and sunlight, photosynthesis can take place. The leaf in the dark did not have sunlight, so it did not produce oxygen, but it still gave off gases. We will discuss what process plants perform without sunlight in the next unit. A fresh leaf will continue to convert sunlight into energy while releasing oxygen for a few hours.

Wow! We learned that plants need water, sunlight, and carbon dioxide to grow. In sunlight, plants release glucose and oxygen. Glucose and oxygen are products of photosynthesis. These three experiments help us to better understand photosynthesis!

Continue using the Yes/No Picture Cards, the Picture Cards from the Photosynthesis **Definition and Picture Cards** Worksheet (Segment 1).

Now it's your turn. Call on a student and hold up two Picture Cards, one correct and one distractor. Touch [oxugen]. Give students time to respond by touching or gesturing toward a Picture Card. Correct! This is [oxygen]. Ask questions to ensure student understanding.

Is oxygen a reactant for cellular respiration? (Yes.)

Do humans produce oxygen when they breathe out? (No. Humans take in oxygen. Plants produce oxygen.)

Repeat the procedure for the remaining Picture Cards.

You may either have one student complete all trials and then move on to the next student, or you may have each student take one or two turns at a time.

Use System of Least Prompts Individual (per student) or Group Data Sheet to collect data.

Provide each student with the Photosynthesis Labeling Worksheet Lv 2/3, scissors, and glue. Place the teacher's copy on the Magnetic Whiteboard.

Now it's your turn! Cut out the Text Cards on the worksheet. Assist students as needed with cutting apart the Text Cards or cut these out for students before the lesson.

Place three Text Cards in front of the student, one correct and two distractors. Let's look at the bottom right section of the worksheet near the plant leaf. [Are chloroplasts organelles found in plant leaves?] Give students time to respond. **Correct!** [Chloroplasts are found in plant cells. Plant cells can be found on the leaves of a plant.] Find the Text card that says [chloroplast] and place it in the box next to the [plant leaf]. Give students time to respond. After the student has responded, assist the student as needed with placing the Text Card in the correct box. Repeat this procedure for the remaining Text Cards until all boxes on the worksheet have been labeled.

Provide each student with the Photosynthesis Labeling Worksheet Lv 2/3, scissors, and glue. Place the teacher's copy on the Magnetic Whiteboard.

Now it's your turn! Cut out the Text Cards on the worksheet. Assist students as needed or cut out the Text Cards from the worksheet for students.

First, read each Text Card. Then, place the Text Cards in the correct boxes on the worksheet. Assist the student as needed with placing the Text Card in the correct box on the worksheet.

After students are done, check their work and have them glue the Text Cards on the worksheet.

If the completed worksheet does not provide enough data, use System of Least Prompts Individual (per student) or Group Data Sheet to collect additional data as needed.



	LEVEL 1	LEVEL 2	LEVEL 3
		After students are done, check their work and have them glue the Text Cards on the worksheet.  If the completed worksheet does not provide enough data, use System of Least Prompts Individual (per student) or Group Data Sheet to collect additional data as needed.	
PROMPTING AND ERROR CORRECTION	Verbal Prompt: Find [oxygen].  Model Prompt: Watch me. Touch the correct Picture Card. This is [oxygen. Oxygen is a natural, colorless, odorless gas produced during photosynthesis]. Your turn.  Physical Prompt: Do it with me. This is [oxygen]. Use hand-over-hand guidance and physically prompt the student to touch the [oxygen] Picture Card.	Verbal Prompt: Find the [chlord Model Prompt: Watch me. Point This is [chloroplast]. Place and on the worksheet. Your turn.  Physical Prompt: Do it with me. hand-over-hand guidance and phy [chloroplast] Text Card.	t to the [chloroplast] Text Card. glue the [chloroplast] Text Card  This is [chloroplast]. Use

REINFORCE

Excellent work! We learned a lot about photosynthesis. We learned that plants need water, carbon dioxide, and sunlight to make glucose (sugar) and oxygen. We also learned that the process of photosynthesis occurs inside cell organelles called chloroplasts. Finally, we learned that all green plants make their own food through the process of photosynthesis!



# Instructional Tip!

- This instruction provides recommendations for how the experiments and Photosynthesis Task
  Analysis Worksheet be implemented. Please keep in mind that student safety should always
  take priority during experiment lessons. If the implementation of any or all steps of the
  experiment as written would create an unsafe situation for any students, please modify the
  instructions such that student safety is ensured.
- At the end of the lesson segment, put each student's Definition and Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet into a small plastic bag for use in Segment 5.



# **Applying What We Know**

# **Learning Objectives**

Identify the products and function of photosynthesis.

## **Materials**

- Print the following worksheets and data sheets:
  - Unit 93 Lesson 1 SCI Photosynthesis
     Research Worksheet Lv 2/3 (per Level 2 and 3 student and teacher)
  - Unit 93 Lesson 1 SCI Photosynthesis
     True/False Questions Worksheet Lv 2
     (per Level 2 student and teacher)
  - Unit 93 Lesson 1 SCI Photosynthesis
     Multiple Choice Questions Worksheet
     Lv 3 (per Level 3 student and teacher)
  - Unit 93 Lesson 1 SCI Photosynthesis
     Definition and Picture Cards
     Worksheet (print new copy or use copy from Segment 1)
  - Classroom Resources Yes/No Cards
     Worksheet (per Level 1 student)

- Constant Time Delay Individual (per student) or Group Data Sheet
- System of Least Prompts Individual (per student) or Group Data Sheet
- Gather the following materials from the enCORE Manipulatives Kit and/or your classroom:
  - Magnetic Whiteboard
  - Magnetic Picture Pockets
  - Classroom computers with internet access (per Level 2 and 3 student)
  - Dry erase marker
  - Pencil (per Level 2 and 3 student)
  - Notebook paper, if needed (per Level 2 and 3 student)

## **Prior to Instruction**

To prepare for teaching this lesson segment, follow these steps:

- 1. Gather, print, and prepare all materials listed to the right.
- 2. If you plan to program students' AAC devices, program the following words:

LEVEL 1	LEVEL 2	LEVEL 3
<ul> <li>vocabulary words         (photosynthesis, chloroplast, chlorophyll, reactants, oxygen, products)     </li> <li>plant</li> </ul>	<ul> <li>vocabulary words         (photosynthesis, chloroplast,         chlorophyll, reactants,         oxygen, products)</li> <li>plant</li> </ul>	<ul> <li>vocabulary words         (photosynthesis, chloroplast, chlorophyll, reactants, oxygen, products)     </li> <li>plant</li> </ul>

#### **Anchor Instruction for All Students**

Prior to beginning instruction, anchor instruction by referencing the Companion Text Unit 93
Lesson 1 Science Companion Text. This week, we have been reading Unit 93 Lesson 1 Science
Companion Text. The subtitle of this companion text is Photosynthesis. We have learned
a lot about the process of photosynthesis and its purpose! What is the difference
between a reactant and a product? Give students time to respond. Correct! Reactants
are the ingredients needed for a chemical reaction to occur, while products are what
is created at the end of a chemical reaction. Let's review what we have learned about
photosynthesis!

# **Core Vocabulary and Concepts**

In this section, introduce the vocabulary listed below using either Constant Time Delay or System of Least Prompts. For details on these instructional methods, see the Core Vocabulary and Concepts Instructional Methods section at the front of this Teacher's Guide or access the Core Vocabulary and Concepts Instructional Methods resources under Resources > Instructional Methods on the enCORE 9-12 web-based application.

Materials: Unit 93 Lesson 1 SCI Photosynthesis Definition and Picture Cards Worksheet (use copy from Segment 1), Constant Time Delay Individual (per student) or Group Data Sheet, System of Least Prompts Individual (per student) or Group Data Sheet, Magnetic Whiteboard, Magnetic Picture Pockets

**Prior to Instruction:** Select instructional method (i.e., Constant Time Delay or System of Least Prompts). Then, prepare the corresponding individual or group data sheet to collect data on your students as you teach the vocabulary below. Place all the cards from the Photosynthesis Definition and Picture Cards Worksheet into the Magnetic Picture Pockets. Place the Definition Cards on the left side of the Magnetic Whiteboard. Place the Picture Cards on the right side of the Magnetic Whiteboard.

VOCABULARY WORD	DEFINITION	LEVELS
photosynthesis	the process where a green plant takes in water and carbon dioxide to make food (sugar) and oxygen when the plant is exposed to light	1, 2, 3
chloroplast	the location where plant cells make their own food (photosynthesis)	1, 2, 3
chlorophyll	a green substance inside the chloroplast that absorbs light energy during photosynthesis	1, 2, 3
reactants	the ingredients needed for a chemical reaction to occur	1, 2, 3
oxygen	a natural, colorless, odorless gas produced during photosynthesis	1, 2, 3
products	something that is created at the end of a chemical reaction	1, 2, 3

# Organize and Share What We Know Now

Materials: Unit 93 Lesson 1 SCI Photosynthesis Research Worksheet Lv 2/3 (per Level 2 and 3 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis True/False Questions Worksheet Lv 2 (per Level 2 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis Multiple Choice Questions Worksheet Lv 3 (per Level 3 student and teacher), Unit 93 Lesson 1 SCI Photosynthesis Definition and Picture Cards Worksheet (print new copy or use copy from Segment 1), Classroom Resources Yes/No Cards Worksheet (per Level 1 student), System of Least Prompts Individual (per student) or Group Data Sheet, Magnetic Whiteboard, Magnetic Picture Pockets, classroom computers with internet access (per Level 2 and 3 student), dry erase marker, pencil (per Level 2 and 3 student), notebook paper, if needed (per Level 2 and 3 student)

**Prior to Instruction:** Reuse the Definition and Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1) for all students. Place all the cards in Magnetic Picture Pockets. On the Magnetic Whiteboard, write the vocabulary words: photosynthesis, chloroplast, chlorophyll, reactants, oxygen, and products. Below each vocabulary word, write a brief description (i.e., photosynthesis is the process where green plants make food and oxygen when exposed to light). Use for additional support with Level 2 and 3 students.

LEVEL 1 LEVEL 2 LEVEL 3

INTRODUCE

Let's review what we have learned about photosynthesis! During the process of photosynthesis, plants take in water, carbon dioxide, and sunlight. These are called reactants. At the end of the process, glucose and oxygen are both produced. These are called the products.

Let's review what we have learned about photosynthesis! During the process of photosynthesis, plants take in water, carbon dioxide, and sunlight. These are called reactants. At the end of the process, glucose and oxygen are both produced. These are called the products. Today we are going to research more about the process of photosynthesis.

Provide each student a set of Yes/No Cards from the Yes/No Cards Worksheet. Tell students to use their Yes/No Cards. Wait for the student to respond by holding up or gesturing towards a Yes/No Card.

Use the Picture and Definition Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1).

Let's review! Hold up the [products] Picture Card.

Products are something that is created at the end of a chemical reaction.

**Is sunlight a product of photosynthesis?** (No. Sunlight is a reactant in photosynthesis.)

Provide each student with a Photosynthesis Research Worksheet Lv 2/3, a pencil, a computer, and notebook paper, if needed. Place the teacher's copy on the Magnetic Whiteboard.

For this activity, you will research photosynthesis and answer questions about this process. Students can work in groups of two or individually to complete the research activity.

First, identify the research topic that you will be learning more about. As you can see, you will be researching more about photosynthesis. Then, answer the questions based on what you learned from your research.

Assist students as needed with researching, reading, and answering the questions on the worksheet. Encourage students to reference the information on the Magnetic Whiteboard as needed. Have additional notebook paper available for students who need more space to write. If the student needs additional support, use a blank sheet of paper to limit the student's visual field on their worksheet to one question at a time.

MODEL

Continue using the Yes/No Cards and the Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1).

Hold up the [photosynthesis]
Picture Card. Photosynthesis
is the process where a green
plant takes in water and
carbon dioxide to make food
(sugar) and oxygen when
the plant is exposed to light.
Does photosynthesis take

**Let's share what we have learned.** After students are done, check the completed worksheet and review the answers as a class.

Wow! Through our research, we have learned even more about the process of photosynthesis. Summarize facts learned through research.

Continue using the Yes/No Cards and the Picture Cards from the Photosynthesis Definition and Picture Cards Worksheet (from Segment 1).

place in green plants? (Yes.)

Now it's your turn. Call on a student and hold up two Picture Cards, one correct and one distractor. Touch [reactants]. Give students time to respond by touching or gesturing toward a Picture Card. Correct! [Reactants are the ingredients needed for a chemical reaction to occur.]

Repeat the procedure for the remaining Picture Cards.

You may either have one student complete all trials and then move on to the next student, or you may have each student take one or two turns at a time.

Use System of Least Prompts Individual (per student) or Group Data Sheet to collect data. Provide each student with the Photosynthesis True/False Questions Worksheet Lv 2 and a pencil.

Now it's your turn. Place the teacher's copy of the worksheet on the Magnetic Whiteboard. Read one statement at a time. As I read each statement, circle if the statement is True or False. Assist students as needed. Encourage students to reference the information on the Magnetic Whiteboard as needed.

If the statement is False, have students fix the statement to make it True. After students are done, check the completed worksheet.

Repeat the procedure for the remaining statements. If the student needs additional support, use a blank sheet of paper to limit the student's visual field on their worksheet.

If the completed worksheet does not provide enough data,

(continued)

Provide each student with the Photosynthesis Multiple Choice Questions Worksheet Lv 3 and a pencil.

Now it's your turn. Place the teacher's copy of the worksheet on the Magnetic Whiteboard. Read each question. Circle the correct answer.

Assist students as needed. Encourage students to reference the information on the Magnetic Whiteboard as needed.

After students are done, check the completed worksheet.

If the completed worksheet does not provide enough data, use System of Least Prompts Individual (per student) or Group Data Sheet to collect additional data as needed.



	LEVEL 1	LEVEL 2	LEVEL 3
		use System of Least Prompts Individual (per student) or Group Data Sheet to collect additional data as needed.	
PROMPTING AND ERROR CORRECTION	Verbal Prompt: Touch [reactants].  Model Prompt: Watch me. Point to the correct Picture Card. These are [reactants]. Your turn.  Physical Prompt: Do it with me. These are [reactants. Reactants are the ingredients needed for a chemical reaction to occur.] Use hand-over-hand guidance and physically prompt the student to touch the [reactants] Picture Card.	Verbal Prompt: Circle True or False. [Animals and plants perform].  Model Prompt: Watch me. Circle [False] on the teacher's copy on the Magnetic Whiteboard. [False. Both animals and plants do not]. Your turn.  Physical Prompt: Do it with me. Circle [False] on the teacher's copy on the Magnetic Whiteboard. [False. Both animals and plants do not]. Use hand-overhand guidance and physically prompt the student to circle [False] on the worksheet.	Verbal Prompt: Circle the correct answer to the question. [Which organisms perform photosynthesis?] Model Prompt: Watch me. On the teacher's copy on the Magnetic Whiteboard, Circle [plants]. Your turn. Physical Prompt: Do it with me. Circle [plants]. Use hand-over-hand guidance and physically prompt the student to circle [plants] on the student's worksheet.
REINFORCE	Great job! You learned about and answered questions relating to the process of photosynthesis. Wow! We learned a lot about plants!	Excellent job! You researched photosynthesis to better understand this process. You also answered True/False questions about what we learned. Wow! We learned a lot about plants!	Terrific job! You researched photosynthesis to better understand this process. You also answered multiple-choice questions about what we learned. Wow! We learned a lot about plants!

# Science for Life: Generalization and Extension Activities

To provide your students with opportunities to generalize and extend their knowledge via Sciencefocused Transition skills, please complete any or all of the following activities.

ACTIVITY	DESCRIPTION
Vocational Skills	Review the definition of reactants. Compare this to the different skills and tasks required for a specific job. Review the definition of products. Ask students to list or discuss different benefits and results from working (e.g., income, esteem, socialization, etc.).

ACTIVITY	DESCRIPTION
Home Skills	Compare the process of baking cookies to the process of photosynthesis. Have students gather the supplies needed to bake cookies. Discuss the ingredients or reactants needed. Support students with following a recipe. Discuss the differences between the cookies before and after baking.
Community Skills	Students can volunteer at a local nursery, greenhouse, or garden center. Have students make sure that each plant in a designated area has access to water and sunlight. If a plant does not appear to be receiving enough water or sunlight, encourage students to share this information with a professional.
Personal Life Skills	Remind students that oxygen is a gas produced during photosynthesis. Discuss how humans and animals breathe in oxygen to survive. Explain how simple breathing exercises can also help students regulate their emotions, manage stress, handle frustration, address fear, and improve their focus and attention. Introduce a few simple breathing exercises for students to try.
Leisure Skills	Have students practice taking care of different plants around the classroom or school. Students should check that each plant has enough soil, water, and sunlight.