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Story 1. Kurt plans ahead

SUPPORT LEVEL I

This unit begins by providing an intensive level of support to students. Model the steps, then have students follow your model immediately.

MATH VOCABULARY

map, point, line segment, plane

MATERIALS

- Picture of a world map
- Concept Maps from Appendix B: point, line segment, plane
- **MathWork,** pages 8–9
- Grocery Map Poster

OPTIONAL MATERIALS

- Picture of a local grocery store

- AAC device preprogrammed with the following: map; point; line segment; plane; two problem statements; points A, B, P, D, E, C, F; line segments AP, PD, DE, EA; plane APDE; dairy; bakery; produce; deli; frozen foods; cereal; milk
- Pointer/light pointer or eyegaze board
- Response cards: point; line segment; plane; points A, B, P, D, E, C, F; line segments AP, PD, DE, EA; plane APDE; dairy; bakery; produce; deli; frozen foods; cereal; milk
- Problem statements from Appendix C

OPENING

Explain the lesson objective by saying to students: **Today we're going to learn about the math we use to help us picture the world around us. We use math in our lives every day. Geometry is math that helps us make pictures of the world around us.**

Task Analysis

1 Introduce math terms, grocery store map, and story.

Introduce the geometry terms *map, point, line segment,* and *plane* using a map of the world and the Concept Maps.

Hold up the picture of the world map and say: **A picture of the world around us is called a *map.* Some maps show pictures of big places, like the whole world on this world map. This is a map. Say *map.*** Have students say *map* while pointing to the world map.

Then point to the word *map* on the grocery store map and say: **This is the word *map.* Say *map.*** Have students say *map* while pointing to the word *map.*

Introduce the term *point* by saying: **Maps have a special name for a place, called a *point.* A point is a place, or a location on a map.**

Then using the Concept Map for point, touch the point while saying: **This is a picture of a point. Say *point.*** Have students touch and say *point.*

Then say: **This is the word *point.* Say *point* again.** Have students say *point* while touching the word *point.*

Touch the capital D and say: **Sometimes a point is named by a capital letter. This is point D.**

Using the Concept Map for line segment say: **Sometimes, we go from one point to another. The line that goes from one point to another is called a *line segment.*** Have students say *line segment* while pointing to the picture for line segment.

Then say: **These words say *line segment.*** Have students say *line segment* while pointing to the words *line segment.*

Follow the line segments on the Concept Map for plane. Say: **When the line segments form a figure on a map, it's called a *plane.*** Have students say *plane* while pointing to the picture of plane on the Concept Map.

Say: **This is the word *plane.*** Have students say *plane* while pointing to the word *plane.*

Look at the grocery store map in your book. This is a map of a grocery store. The points on the map are places in the grocery store. Direct students' attention to each point as you read them from the grocery store map.

Ask students to tell what they know about shopping at a grocery store (show a picture of a local grocery store if available). Have students tell you about the grocery store where they shop, and what they like to buy. Then tie the discussion to the lesson by saying: **Today we're going to read a story about Kurt, who goes shopping at a grocery store. We'll make a picture of Kurt's shopping trip using a map. We'll use the facts from the story and the points on the map to show the best route around the store. Then, the facts from the story and the points on the map will help us solve a problem.**

2 Identify the problem.

Read "Story 1: Kurt Plans Ahead" with students.

Read the story a second time and have students read along with you. As you read, use the Grocery Map Poster to identify the food mentioned in the story. Think aloud as you name the grocery items and the department in the store in which they might be found, e.g.: **Oranges, I would find oranges in the produce department.**

When you reach the last sentence, point to it and say: **We have a problem to solve. The problem is "What item did Kurt get next?" We're going to use your grocery store map to help solve the problem. Let's start.**

Using the Grocery Map Poster, point to the two problem statements. Ask: **What do we need to find out?** Have students point to the correct problem statement on their grocery store maps and then say the problem statement.

Ask students again, **What is the problem? What do we need to find out?** Have students check the box on their grocery store maps.

3 Identify the first point on the grocery store map.

Now that we know what the problem is, we need to find a way to solve it. We need to find out what item Kurt got next. Direct students' attention to the Grocery Map Poster. Touch point A at Enter/Exit. Say: **When Kurt entered the store, he was at point A. Say *point A.* Now circle point A.** Model circling point A on your Grocery Map Poster.

4 Identify the second point on the grocery store map.

Now let's find the next place Kurt went in the store. Reread the list of items mentioned in the story. Touch the location (point) of the first item (oranges) and model circling point P on your Grocery Map Poster. Say: **Kurt needed to buy oranges. They're in Produce. That's point P. Say *point P.***

Now it's your turn. Show where Kurt went in the store. Great job, you found point P. Circle point P on your grocery store map.

5 Identify the third point on the grocery store map.

Let's continue to find where Kurt went in the store.

Reread the list of items mentioned in the story. Point to the location (point) of the second item on the list (ham) and model

circling point E on your Grocery Map Poster. Say: **Kurt needed to buy ham. That's in the Deli. That's point E. Say *point E.***

Now it's your turn. Show where Kurt went in the store. Great job, you found point E. Circle point E on your grocery store map.

6 Identify the fourth point on the grocery store map.

Let's keep finding where Kurt went in the store. Reread the list of items mentioned in the story. Point to the location (point) of the third item on the list (milk) and model circling point D on your Grocery Map Poster. Say: **Kurt needed to buy milk. That's in Dairy. That's point D. Say *point D.***

Now it is your turn. Show where Kurt went in the store. Great job, you found point D. Circle point D on your grocery store map.

7 Identify the first line segment formed by 2 points in the story.

Now, we'll make a line segment to show how Kurt went through the store. We know he started at point A (touch A on your Grocery Map Poster). **The first thing he bought was oranges. Oranges are in the Produce section, point P. The line segment from the entrance, point A, to the Produce section, point P, is called *line segment AP*** (draw the line segment on your Grocery Map Poster).

Now it's your turn to make line segment AP. Kurt went from point A to point P. He followed line segment AP (trace the line segment on your Grocery Map Poster and have students use their fingers to follow along and then draw the line segment on their grocery store maps).

What line segment did he follow? Good, you made line segment AP. Say *line segment AP.*

8 Identify the second line segment formed by 2 points in the story.

Now, let's make a line segment to show where Kurt went next in the store. The best route to take in the store is from one point to the next closest point. The next closest point will make a line segment that we don't have to cross again. We know he shopped for oranges at point P (touch P on your Grocery Map Poster). **Kurt also had to get milk and ham. Here is the milk** (touch point D) **and here is the ham** (touch point E). **Remember, Kurt is at the Produce section, point P. The line segment from Produce, point P, to the Dairy section, point D, is a line segment that we won't cross again.**

The line segment from Produce, point P, to Dairy, point D, is called *line segment PD* (draw the line segment on your Grocery Map poster).

Now it's your turn to make line segment PD. Kurt went from point P to point D. He followed line segment PD.

Trace the line segment on your Grocery Map Poster and have students use their fingers to follow along on their grocery store maps. Have them place a finger or marker on point P and then on point D and then draw the line segment on their grocery store maps.

What line segment did Kurt follow? Good, you made line segment PD. Say *line segment PD.*

9 Identify the third line segment formed by 2 points in the story.

Let's continue to show where Kurt went next in the story. He shopped for milk in the Dairy section, point D. He shopped for ham, point E. Kurt went from the Dairy section, point D, to the Deli section, point E. He followed line segment DE.

Trace the line segment on your Grocery Map Poster and have students use their fingers to follow along on their grocery store maps. Have them place a finger or marker on point D and then on point E and then draw the line segment on their grocery store maps.

What line segment did he follow? Good, you made line segment DE. Say *line segment DE.*

10 Identify the fourth line segment formed by 2 points in the story.

Let's see where Kurt went next. Kurt shopped for ham in the Deli section, point E. Then, he was finished shopping, so he paid and left the store at the exit, point A. Kurt went from the Deli section, point E; paid for his food; and left the store at the exit, point A. He followed line segment EA.

Trace the line segment on your Grocery Map Poster and have students use their fingers to follow along on their grocery store maps. Have them place a finger or marker on point E and then on point A and then draw the line segment on their grocery store maps.

What line segment did he follow? Good, you made line segment EA. Say *line segment EA.*

11 Identify the route followed to create a plane.

Follow along with me. Kurt followed line segment AP, PD, DE, and EA.

Trace the line segments on your Grocery Map Poster as you say each. Have students use their fingers to follow along on their grocery store maps pointing to the line segments as they're read aloud.

Then say: **The figure made up of these points is called a plane. Kurt followed plane APDE.** Place your finger on each point as you

say it and have students use their fingers to trace the plane on their grocery store maps, pointing to the line segments as they're read aloud.

Show me plane APDE. Good job! This is plane APDE (trace it as you say it.) **Now you say it.**

12 Restate the problem statement.

Now that we know how Kurt went through the store, we can use the map and the plane to solve our problem.

Direct the students to touch the problem statement while you read it. Have students follow along pointing to line segment PD and naming the points as you say: **In the story, it says that first, Kurt bought oranges. He started at point P. When we follow the plane, we see that Kurt went to point D next. Show me point D. Say** *point D.*

13 State the solution in the story context.

Point D is the Dairy section. Kurt went to the dairy section next. Point to Dairy section. Say *Dairy.* **What food is in the Dairy section? Yes, milk. Say** *milk.*

What food did Kurt get next? Kurt got milk. Say *milk.*

Help students write or trace the word *milk*, or glue a picture of milk, on their grocery store maps.

Story 5. Gift cards for the movies

SUPPORT LEVEL III

In this lesson, give less guidance than in Stories 3 and 4. Give general verbal direction to help students solve the problem, but wait to give them an opportunity to proceed before telling them what to do. If a student doesn't respond to decreased guidance or begins to make an error, model the step and have the student immediately respond.

MATH VOCABULARY

add, subtract, equal, first, second, last, x

MATERIALS

- Example of a gift card
- Red and green chips
- Concept Maps from Appendix X: add, subtract, equal, first, second, last

- **MathWork,** pages 52–53
- Equation Prompt Poster

OPTIONAL MATERIALS

- AAC device preprogrammed with the following: add, subtract, equal, first, second, last, two problem statements, x, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
- Pointer/light pointer or eyegaze board
- Response cards: add, subtract, equal, first, second, last, x, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
- Problem statements printed from the CD-ROM

OPENING

Explain the lesson objective by saying to students: **Today we're going to review how math can help us solve problems. Remember, we use algebra to help us solve for unknown numbers. We use math, like algebra, in our lives every day**.

Task Analysis

1 Review math terms and introduce the story.

Direct students' attention to the target words (i.e., *add, subtract, equal; first, second, last*) on each Concept Map. Point to each target word and ask: **What is this word?**

Wait for each student to respond. If no response or an incorrect response, say the word and repeat the question. Praise each correct response.

Show students a gift card. Ask if they have ever received one and discuss what they're used for. Then tie the discussion to the lesson by saying, **Today we're going to read a story about Irene and gift cards she wants to buy for a movie.**

2 Identify the problem.

Read "Story 5: Gift cards for the Movies."

Read the story a second time and have students read along with you. Have students who can read, take turns reading the story. When you reach the last sentence, point to it and say:

We have a problem to solve. What is the problem? What do we need to find out?

Wait 5 seconds for students to respond by stating the problem and checking the box on their equation prompt pages. If no response or an incorrect response, model stating the problem and checking the correct box. Then ask again, **What do we need to find out?**

Have students check the box of the correct problem statement on their equation prompt pages.

3 Identify the first fact in the story.

Now that we know what the problem is, we need to find a way to solve it. We need to find out how many more gift cards Irene needs to buy. What do we need to do first?

Wait 5 seconds for students to respond by finding the sentence in the story with the first fact and writing it in the first fact box of the equation prompt. If a student doesn't respond or begins to make an error, model finding the first fact and writing 1 in the first fact box of your Equation Prompt Poster and say: **Irene already has one gift card. I need to put the number 1 in the first fact box of the equation prompt. Now it's your turn. Point to the first fact in the story. Great job, you found the first fact in the story. Write 1 in the first fact box of the equation prompt.**

Great job, you found the first fact in the story and wrote a 1 in the first fact box of your equation prompt. Say 1.

4 Identify the second fact in the story.

Now, let's find the next fact.

Wait 5 seconds for students to respond by finding the sentence in the story with the second and unknown fact and writing x in the second fact box of the equation prompt. If a student doesn't respond or begins to make an error, model reading part of the fourth sentence: **"She needs to buy more gift cards."** We don't

know how many more gift cards so the second fact is unknown. **We'll call it x. The second fact is x. I need to put an x in the second fact box of the equation prompt. Now it's your turn.** Point to the sentence with the unknown fact. **Great job, you found the sentence in the story with the unknown. Write x in the second fact box of the equation prompt.**

Wow, you found the sentence in the story with the unknown fact and wrote an x in the second fact box of your equation prompt. Say x.

5 Identify the last fact in the story.

What do we need to do next?

Wait 5 seconds for students to respond by finding the sentence in the story with the last fact and writing 6 in the last fact box of the equation prompt.

If a student doesn't respond or begins to make an error, model reading the fourth sentence: **"She needs to buy more gift cards for her six friends."** The last fact in our story is 6. Irene has 6 friends. The last fact is 6. **I need to put a 6 in the last fact box of the equation prompt. Now it's your turn.** Point to the sentence with the last fact. **Great job, you found the sentence in the story with the last fact. Write 6 in the last fact box of the equation prompt.**

Great job. You found the sentence in the story with the last fact and wrote a 6 in the last fact box of your equation prompt. Say 6.

6 Place chips on the number line.

Now can you use the facts on our equation prompts to solve the problem?

Wait 5 seconds for students to respond by placing the green chip on the 1 and the red chip on the 6 on the number line. If a student doesn't respond or begins to make an error, model placing the chips on your Equation Prompt Poster. Say: **I'll put**

the green chip on the 1 and the red chip on the 6. Now it's your turn.

Great job, you put the chips on 1 and 6 on the number line.

7 Identify the operation to use.

Now, we need to decide what operation to use to solve the problem. We can subtract or we can add the numbers. If we count forward we'll be adding, using addition; if we count backward, we'll be subtracting, using subtraction. Today we need to count forward so will we add or subtract?

Wait 5 seconds for students to circle the + symbol for addition. If a student doesn't respond or begins to make an error, model circling the + symbol. Now it's your turn.

Wonderful, you circled the addition sign. Say *add*.

8 Read the equation.

Read the resulting equation aloud, pointing to the facts as you read **1 + x = 6.** Then read it with the students. Say: **Let's read it together**.

9 Count using the number line.

We're ready to solve our problem. Remember that to add means to start counting at the green chip and to count toward the red chip. Count using the number line.

Wait 5 seconds for students to count from 1 to 6. If a student doesn't respond, begins to make an error, or doesn't count with one-to-one correspondence, model counting and then say: **Now it's your turn to count using the number line.**

Good job! You counted going forward because you were adding. Say *add*.

10 Solve for x.

What's next? You solved for the unknown number. What does X equal?

Wait 5 seconds for students to say x = 5. If a student doesn't respond or responds in error, say: **We counted 5 dots. x = 5. What is x?**

Great! You knew that you counted five dots and x = 5.

11 Restate the problem statement.

Now that we solved the equation, we can solve the problem. Read the problem statement aloud: **"How many more gift cards did Irene need to buy?" Did you find the answer to the problem? How many more gift cards did Irene need to buy? Yes, she needs 5 more. Say 5.**

Where do we write 5?

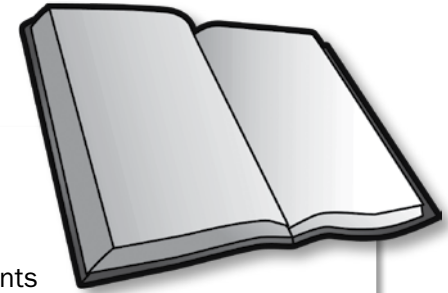**Write 5 on the solution line of your equation prompt: x = _____.**

12 State the solution in the story context.

We found the answer to our problem.

Reread the story and have students follow along pointing to the facts on their equation prompts. **How many more gift cards did Irene need to buy? Yes, 5 more gift cards. Say 5.**

Story 5. Battle of the books

SUPPORT LEVEL III

In this lesson, give less guidance than in Stories 3 and 4. Give general verbal direction to help students solve the problem, but wait to give them an opportunity to proceed before telling them what to do. If a student doesn't respond to decreased guidance or begins to make an error, model the step and have the student immediately respond.

MATH VOCABULARY

most, least, row, column

MATERIALS

- Concept Maps from Appendix B: most, least, row, column
- **MathWork,** pages 88–89
- Bar Graph 1 Poster

OPTIONAL MATERIALS

- AAC device preprogrammed with the following: most, least, row, column, Call of the Wild, Lord of the Rings, 1, 2, 3, 4, 5; two problem statements
- Pointer/light pointer or eyegaze board
- Response cards: most, least, row, column, Call of the Wild, Lord of the Rings, 1, 2, 3, 4, 5,
- Problem statements from Appendix C

OPENING

Explain the lesson objective by saying to students, **Today we're going to learn about the math we can use to help us solve problems. Data analysis is math that helps us make choices and solve problems. We can use bar graphs to keep track of the data. We use math, like data analysis, in our lives every day.**

Task Analysis

1 Review math terms and introduce the story.

Review the data analysis terms *most, least, row, column* using the Concept Maps.

Direct the students' attention to the target word (i.e., *most, least, row, column*) on each Concept Map. Point to each target word and ask: **What word is this?**

Wait for each student to respond. If no response or an incorrect response, say the word and repeat the question. Praise each correct response.

Discuss the favorite books of the students (with a possible follow-up activity of having the class vote for their favorite book from a choice of two). Say: **Today we'll read a story about students in Mr. Williams's class who vote for their favorite book.**

2 Identify the problem.

Read "Story 5: Battle of the Books" with students.

Read the story a second time and have students read along with you. As you read, think aloud as you find the facts mentioned in the story, **At the end of the semester, Mr. Williams asked the students to vote for their favorite book. Hilary and Rose voted for Call of the Wild; that's the first choice,** etc. (point to the first choice on your Bar Graph 1 Poster.) When you reach the last

sentence, point to it and say: **We have a problem to solve. What is the problem? What do we need to find out?**

Wait 5 seconds for students to respond by stating the problem. If no response or an incorrect response, model stating the problem.

Then have students check the box of the correct problem statement on their bar graphs.

3 Identify the first choice.

Now that we know what the problem is, we need to find a way to solve it. We need to find out what book was voted the favorite by Mr. Williams's class. Ask: **What do we do first?**

Wait 5 seconds for students to respond by stating the first choice or pointing to the first choice in the story or on the bar graph. If no response or an incorrect response, reread the sentence and say: **Point to the first choice**.

Good, you found the first choice. The first choice in the story is Call of the Wild. Say *Call of the Wild.*

4 Identify the second choice.

Now that we know one choice, what do we do next?

Wait 5 seconds for students to respond by stating the second choice or pointing to the second choice in the story or on the bar graph. If no response or an incorrect response, reread the sentence and say: **Point to the second choice**.

Great! You found the second choice: Lord of the Rings. Say *Lord of the Rings.*

5 Record the first vote.

Now that we know which books the students will vote on, what's next? What do we do next?

Wait 5 seconds for students to respond by marking the first vote on the bar graph. If no response or an incorrect response, reread the sentence with the first vote and point to *Call of the Wild.* Say: **We need to mark the first vote on the bar graph. Hilary was the first to vote. She voted for Call of the Wild. What's next?**

Wonderful! You marked a vote for Call of the Wild.

6 Record the next vote.

Now that we know how Hilary voted, what do we do next?

Wait 5 seconds for students to respond by marking the second vote on the bar graph. If no response or an incorrect response, reread the sentence with the second vote and point to *Call of the Wild.* Say: **We need to mark another vote on the bar graph. Rose also voted. She voted for Call of the Wild. What's next?**

Good job! You marked a vote for Call of the Wild.

7 Record the next vote.

Now that we know how Rose voted, what do we do next?

Wait 5 seconds for students to respond by marking the third vote on the bar graph. If no response or an incorrect response, reread the sentence with the third vote and point to *Lord of the Rings.* Say: **We need to mark another vote on the bar graph. Jennifer voted for Lord of the Rings. What's next?**

Good job! You marked a vote for Lord of the Rings.

8 Record the next votes.

Now that we know how Jennifer voted, what do we do next?

Wait 5 seconds for students to respond by marking the next vote on the bar graph. If no response or an incorrect response, reread the sentence with the next vote and point to *Lord of the Rings.* Say: **We need to mark another vote on the bar graph. Sienna voted for Lord of the Rings. What's next?**

Excellent! You marked another vote for Lord of the Rings.

9 Record the next votes.

We know how Sienna voted, what do we do next?

Wait 5 seconds for students to respond by marking the next vote on the bar graph. If no response or an incorrect response, reread the sentence with the next vote and point to *Lord of the Rings.* Say: **We need to mark another vote on the bar graph. Jack voted for Lord of the Rings. What's next?**

Excellent! You marked another vote for Lord of the Rings.

10 Identify the choice with the most votes.

Now we know how everyone in the story voted. What's next?

Wait 5 seconds for students to respond by counting the votes. If no response or an incorrect response, model counting the votes and point to Lord of the Rings. Say: **Lord of the Rings has the most votes. It has three votes.**

Good work! You said *Lord of the Rings.*

11 Restate the problem statement.

Now, use the bar graph to solve the problem.

Direct the students to touch the problem statement while you read it: **What book was voted the favorite by Mr. Williams's class?**

12 State the solution in the story context.

Reread the story and when you get to the last sentence, "What book was voted the favorite by Mr. Williams's class?"

Wait 5 seconds for students to respond by stating *Lord of the Rings.* If no response or an incorrect response, model counting the votes and point to *Lord of the Rings.* Say: **Lord of the Rings has the most votes. It has three votes.**

Then have them write or trace the words *Lord of the Rings,* or glue a picture of Lord of the Rings on the bottom of their bar graphs.
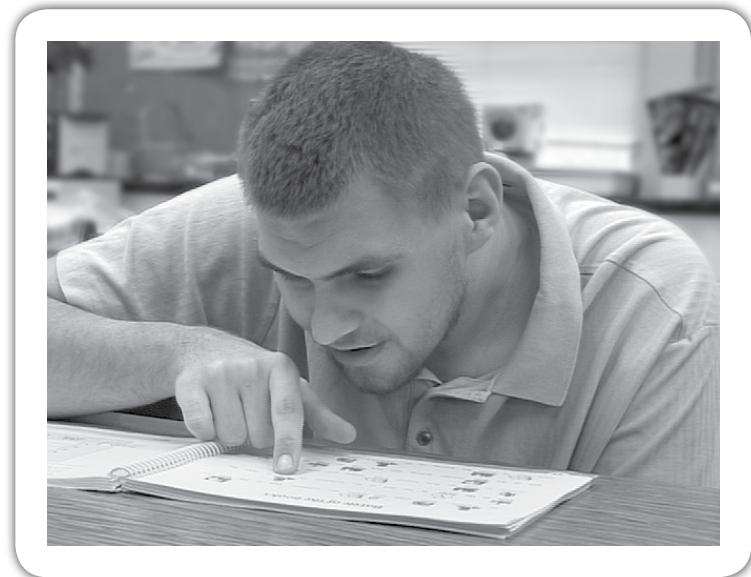
Story 10. Movie day at the gym
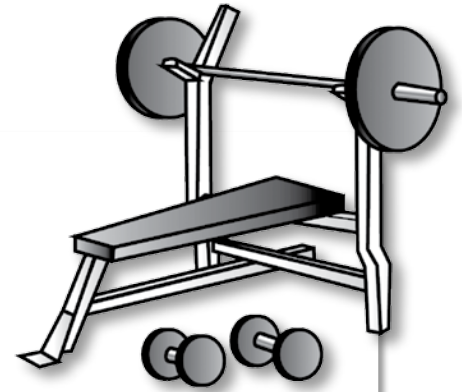
SUPPORT LEVEL V

In this lesson, the students solve the problem without your help. Be sure to let the students know that you want them to try it alone. Watch for mistakes and correct them if needed. Wait for students to do each step of the entire task analysis alone. As directed in the script, students independently identify the problem, the price, the dollar amount, and the cents in the story; count out the dollar bills and "one more than"; and add the answer to the problem statement on the Next Dollar Line pages. If students struggle to be independent, provide support using the least number of prompts possible.

MATH VOCABULARY

dollar

MATERIALS

- **MathWork,** pages 134–135
- A set of 10 $1 bills per student
- Next Dollar Line Poster

OPTIONAL MATERIALS

- AAC device preprogrammed with the following: two problem statements, $4.75, numbers 1–10
- Pointer/light pointer or eyegaze board
- Response cards: $4.75, numbers 1–10
- Problem statements from Appendix C

OPENING

Explain the lesson objective by saying to students: **Today we're going to learn about math we use to help us solve problems. We use math in our lives every day. The next dollar strategy helps us count money. Remember, we always have to give the cashier one more dollar for the cents in our price.**

Task Analysis

1 Introduce the story.

Ask students if they or their parents have ever gone to a gym or youth center. Explain that some gyms have other activities for children like movies. Then say: **Today we'll read a story about James and his friends who went to the gym to watch a special movie. They bought popcorn for the movie. You're going to solve this problem on your own. I'll help you if you need help but try to solve it on your own.**

2 Identify the problem.

Read "Story 10: Movie Day at the Gym."

Read the story a second time and have students read along with you. Have students who can read, take turns reading the story. When you're done reading the story, say: **You know how to solve the problem on your own. What is the problem? What do you need to find out?**

Wait for students to read or point to the problem statement and then check it on their Next Dollar Line pages.

Then say: **Now that you know what the problem is, you need to find a way to solve it. You need to find out how many dollars James and his friends gave the cashier for the popcorn.**

3 Identify the price in the story.

Now you be the teacher! Solve the problem without my help. Go ahead and solve the problem on your own.

Wait for students to identify the price in the story.

4 Identify the dollar amount in the price.

Wait for students to identify the dollar amount in the price.

5 Count out the dollar bills.

Wait for students to count out the dollar bills using the Next Dollar Line.

6 Count "one more than."

Wait for students to count out "one more than" 4 dollars using their Next Dollar Lines.

7 Restate the problem statement.

Wait for students to look back at the problem statement and then count the dollar bills.

Then, read the problem statement aloud: **"How many dollars did James and his friends give the cashier?"** Did you find the answer to the problem? Yes, they gave the cashier 5 dollars. Where will you write the 5?** Wait for students to add a 5 on the solution line.

8 State the solution in the story context.

You found the answer to your problem.

Reread the story and have students follow along. **How many dollars did James and his friends give the cashier? I'm so proud of you for solving this problem on your own.**

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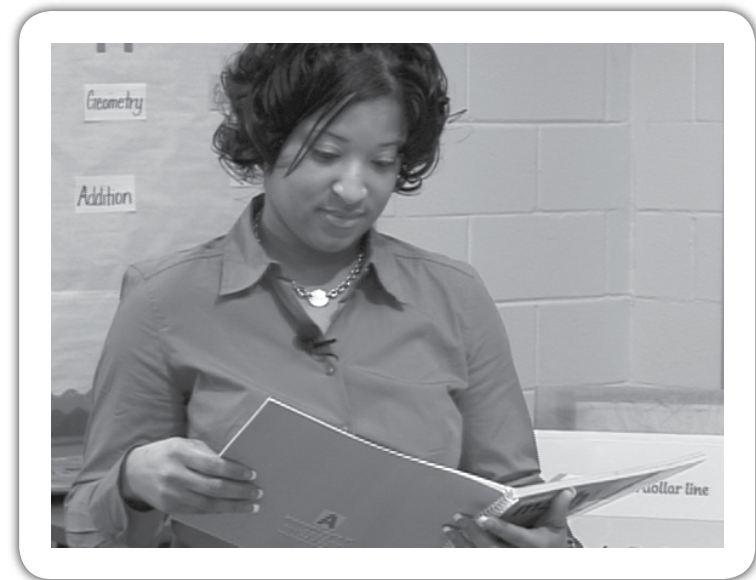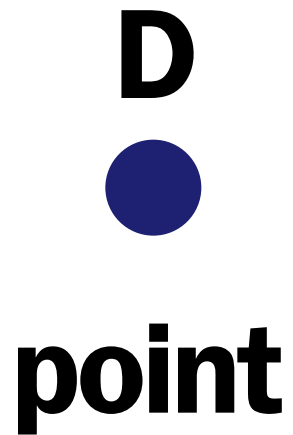
point

A point is a place.

It is named by a capital letter.

A •———————————————————————• B

line segment

A line segment is a line between two points.

plane

A plane is a flat surface made of points.