Kindergarten
Items for
Assessing Mathematical Understanding

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2011

Portland, OR

Kindergarten Items for Assessing Mathematical Understanding

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ISBN 978-089354-120-0

Cover image by Lucas Grzybowski

Contents

Instructions

This assessment is one of four components of Assessing Mathematical Understanding. It is recommended that users familiarize themselves with the background, concept areas, learning goals, and organizational framework found in *A Guide for Assessing Mathematical Understanding* before using this assessment. Detailed instructions and sample records for using this assessment are found on pages 37–43 of the *Guide.* A blank student record and a class record can be found in the appendix of the *Guide.*

Preparation

1. **Collect the materials** necessary for the assessment.
2. **Set up a space** that is free from distractions and allows the teacher or other test administrator and student to sit comfortably face-to-face with the test booklet open on the table between them. There should be sufficient workspace for the student to lay out manipulatives and to write.
3. **Bring one student at a time** to the interview location.
4. **Read the introductory script.**
   a. Say, "Today I am going to ask you some number questions. Do you like number questions?"
   b. Say, "It's OK to say, 'I don't know,' or 'Let's move on,' for any question."
   c. Say, "I will read a problem over again, if you ask me to."
   d. Say, "You may use any of the objects on the table to help you think about the question."
   e. Say, "Are you ready to begin? OK, let's get started." (Or wait if the student has a question.)

Administration and Scoring

5. **Read each item as printed and elaborate, if necessary.** The goal is for the student to be able to show what he or she knows.
   a. You may paraphrase or repeat anything in the assessment.
   b. You may offer manipulatives shown on each page.
   c. Students may point (rather than speak) to indicate an answer when appropriate.
   d. If a student does not know his or her colors or is unfamiliar with a vocabulary word, you may clarify.
   e. There is no time limit for responses (except as indicated in the assessment).
   f. Units are not required for correct answers. For example, "5" and "5 dogs" are both correct.
6. **Give neutral feedback** that does not indicate whether the student has answered correctly or incorrectly. Maintain a neutral expression. Reinforce students' good effort. You might use the following:
   a. "Thank you."
   b. "I see just what you did."
   c. "Good work!"
   d. "Was that a hard/easy problem?"
   e. "Nice job!"
   f. "Shall we go on to the next one?"

7. **Record student responses** to each item and mark the student record using the indicated codes.
8. **Follow the "moving through the assessment" directions.** In the lower right portion of each teacher's page there are instructions telling whether to advance to the next question or skip to a later question if the student answers incorrectly.

After Each Assessment

9. Complete the learning profile on the student record.
10. Compute a cumulative score using the point values indicated.

Advance Preparation

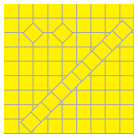
Materials needed

- Two clear plastic bags prepared as follows:
  - Bag A has 6 loose linking cubes (section 1, item K6)
  - Bag B has 17 loose linking cubes (section 1, item K7)

- Paper and writing tool for the student

- A supply of about 25 additional linking cubes (loose)

- A supply of base-ten blocks (1 flat, 10 longs, 10 units)

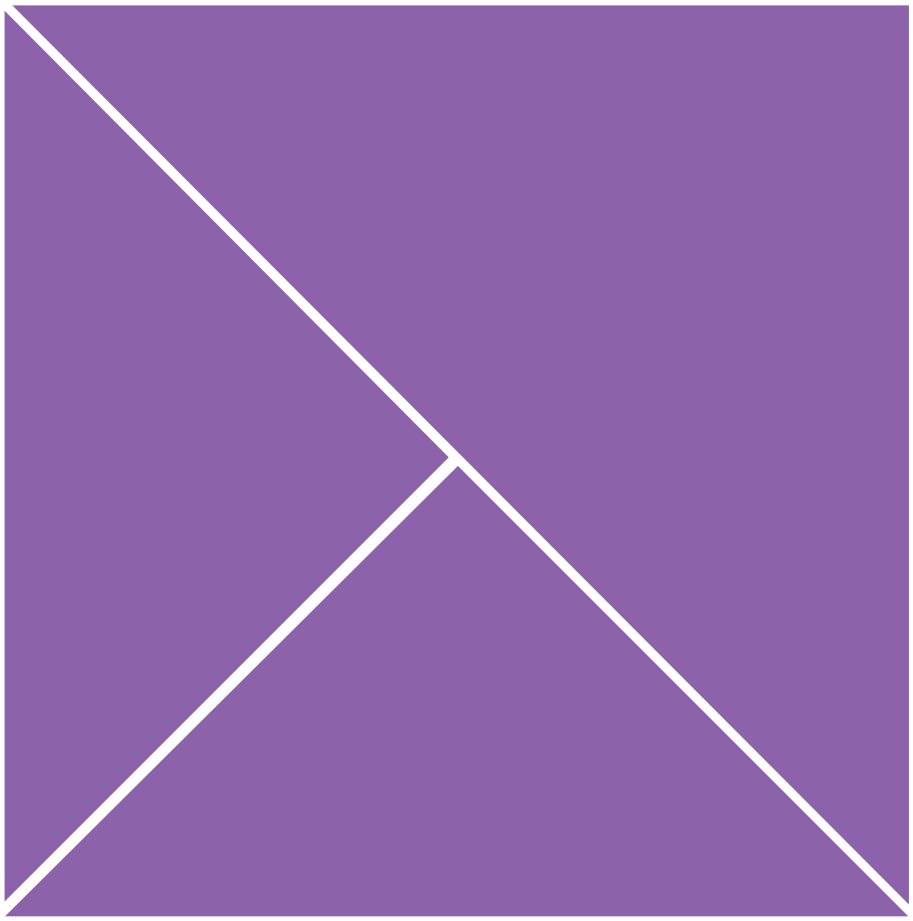


- A 9-inch length of string or yarn (item K12)

- Prepare number cards (see page 5, for section 2, item K24)

- Prepare triangles (see page 6, for section 3, item K35)

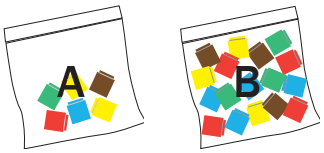

8
7
4



Section 1

Materials needed

- Two clear plastic bags prepared as follows:
  - Bag A has 6 loose linking cubes (item K6)
  - Bag B has 17 loose linking cubes (item K7)



- Paper and writing tool for the student

- A supply of about 25 additional linking cubes (loose)

- A 9-inch length of string or yarn (item K12)

Student's page

Count for Me

Count for Me

- Say, **"Count for me until I say stop."**
- Stop the student when he or she reaches 40.

Materials available

none

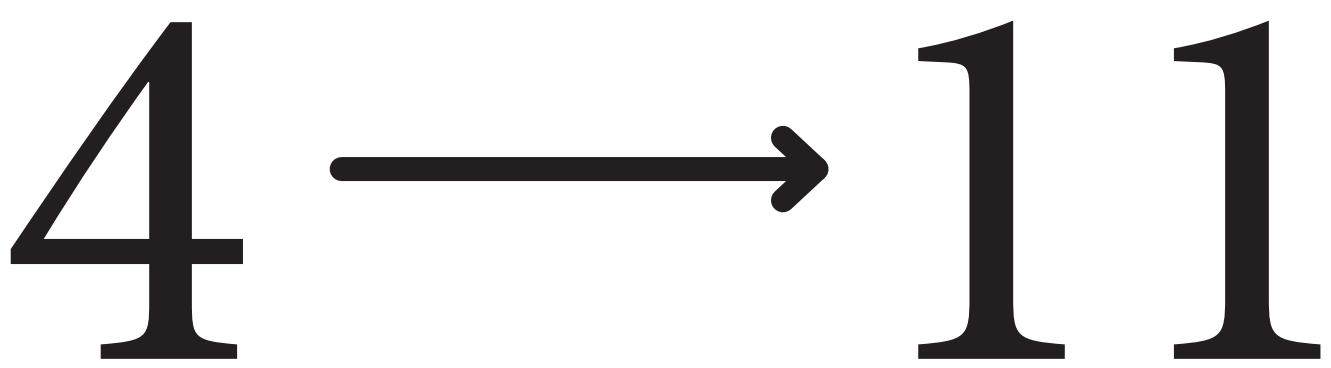
Moving through the assessment

Incorrect counting to 10: Skip to item K6.
Correct counting to 20 or 40: Turn the page.

Correct response

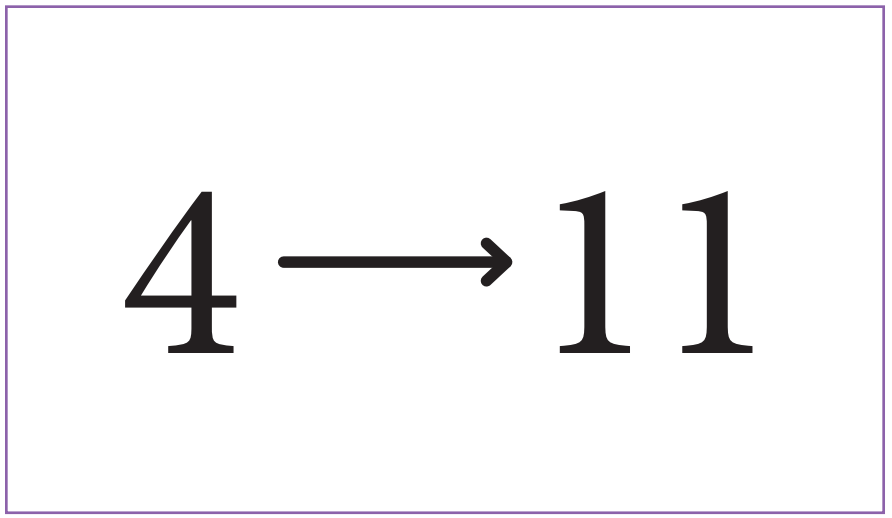
Accurate count to 10, 20, 40

Count From 4 to 11



Count From 4 to 11

- Say, **"Count from 4 to 11."**
- If necessary, use this prompt: **"Say 4."**
- Wait for the student to say "4."
- Say, **"Now keep counting up from 4 until you reach 11."**



Moving through the assessment

Incorrect: Skip to item K6.

Materials available

none

Correct response

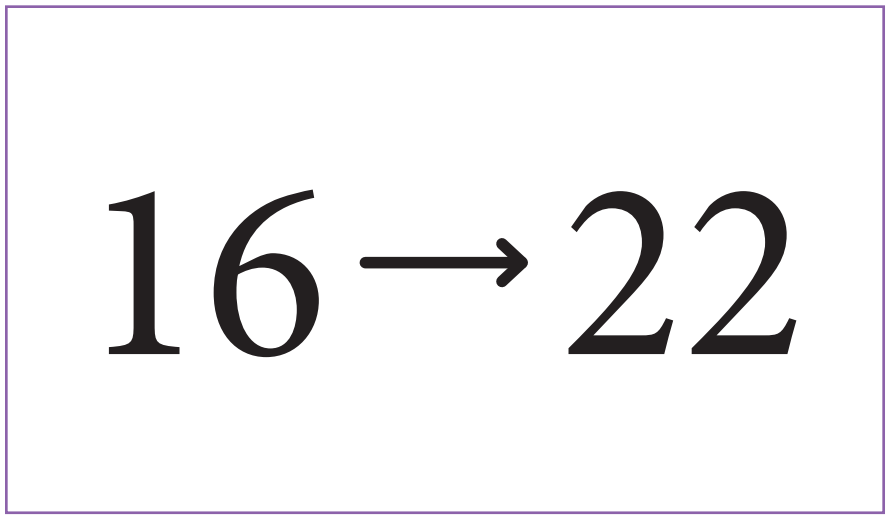
4, 5, 6, 7, 8, 9, 10, 11

Count From 16 to 22

16 → 22

Count From 16 to 22

- Say, **"Count from 16 to 22."**
- If necessary, use this prompt: **"Say 16."**
- Wait for the student to say "16."
- Say, **"Now keep counting up from 16 until you reach 22."**



Moving through the assessment

Incorrect: Turn the page.

Materials available

none

Correct response

16, 17, 18, 19, 20, 21, 22

Student's page

How Many Cubes in Bag A?

Teacher's page

How Many Cubes in Bag A?

- Use Bag A with six cubes.
- Hand Bag A to the student.
- Say, **"How many cubes are in this bag? You may take the cubes out of the bag, if you would like."**

Materials available

Moving through the assessment

Incorrect: Skip to item K8.

Correct response

6 (cubes)

Student's page

How Many Cubes in Bag B?

How Many Cubes in Bag B?

- Use Bag B with 17 cubes.
- Hand Bag B to the student.
- Say, **"How many cubes are in this bag? You may take the cubes out of the bag, if you would like."**

Materials available

Moving through the assessment

Incorrect: Turn the page.

Correct response

17 (cubes)

Student's page

Place Nine Cubes on the Page

9

Place Nine Cubes on the Page

- Place the supply of loose cubes within easy reach.
- Say, **"Place 9 cubes on the page."**
- When the student is done, slide the cubes off the page keeping them in a group.

9

Moving through the assessment

Incorrect: Skip to item K10.

Materials available

Correct response

Places 9 cubes

Place 16 Cubes on the Page

16

Place 16 Cubes on the Page

- Place the supply of loose cubes and the nine cubes from the previous problem within easy reach.
- Say, **"Place 16 cubes on the page."**

16

Moving through the assessment

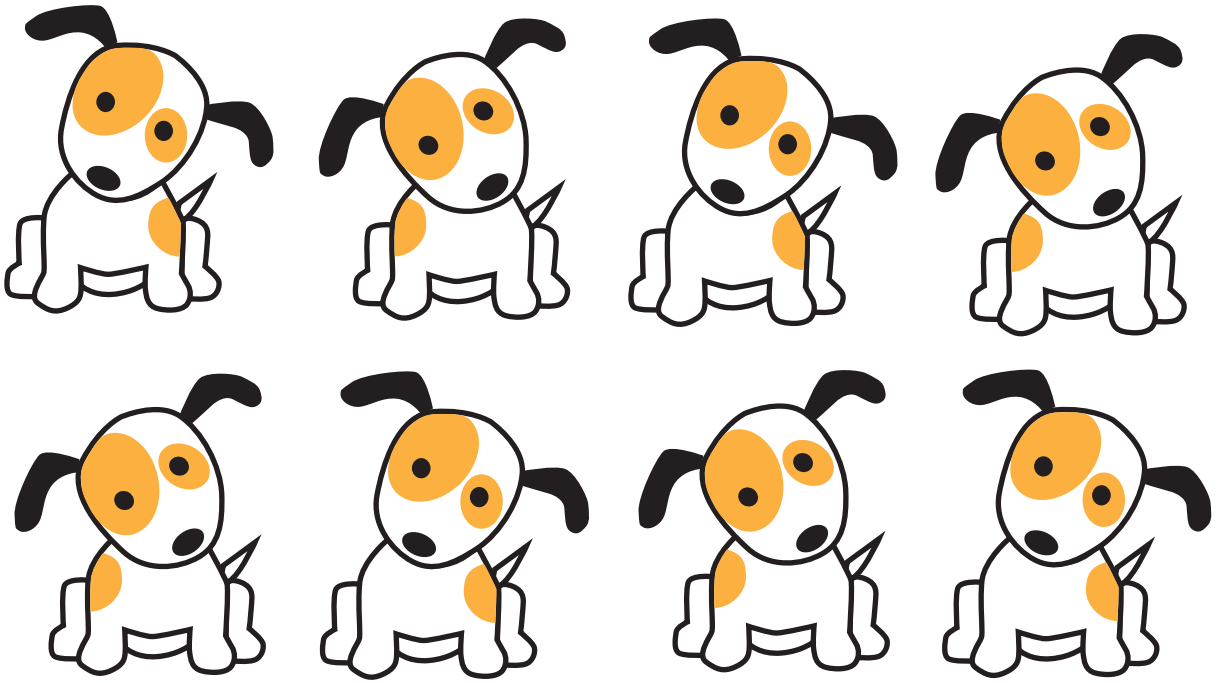
Incorrect: Turn the page.

Materials available

Correct response

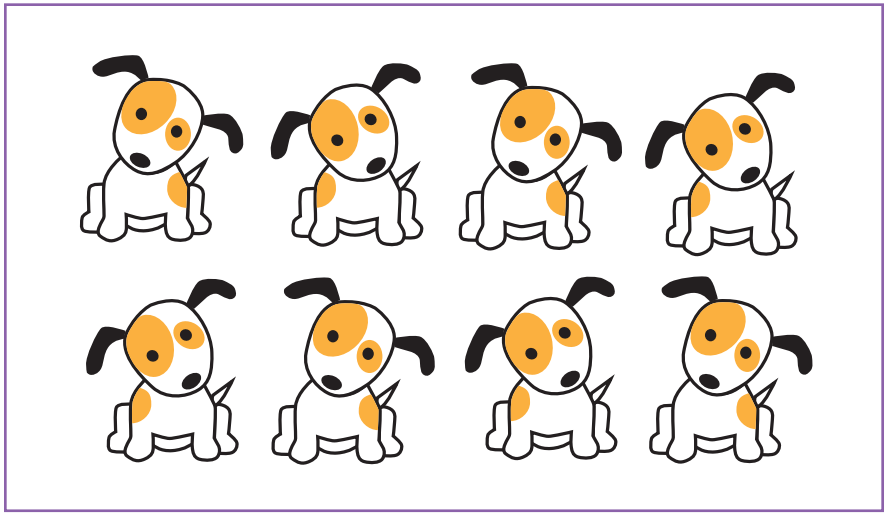
Places 16 cubes

Write the Number of Dogs



Write the Number of Dogs

- Say, **"Count the dogs on this page. *Write* the number on this paper."**
- Allow the student to touch the pictures on the page.
- If the student counts incorrectly, but correctly writes the number he or she says, score *p (partially correct)*.



Moving through the assessment

Incorrect: Skip to item K12.

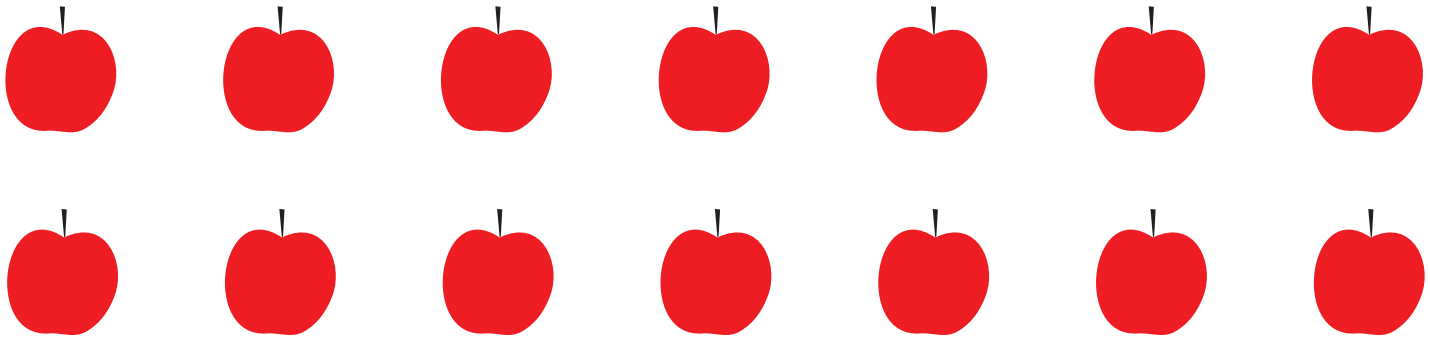
Materials available

Correct response

Writes "8"

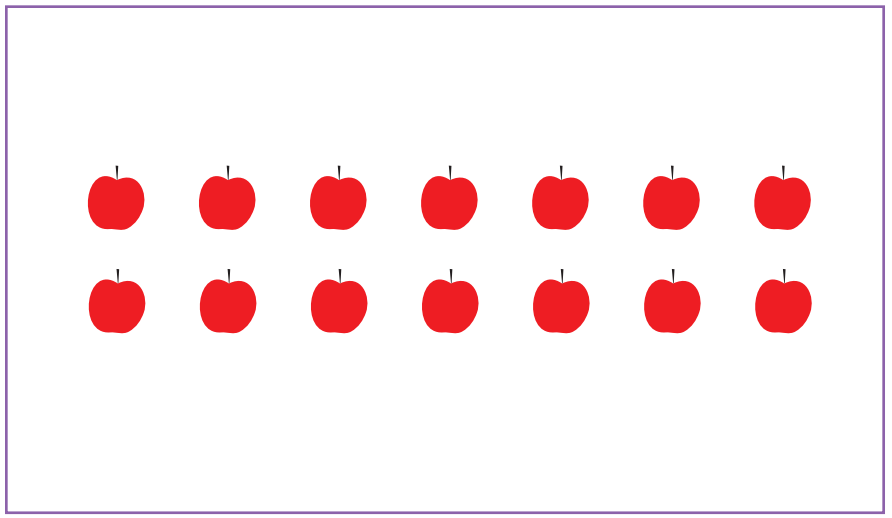
Student's page

Write the Number of Apples



Write the Number of Apples

- Say, **"Count the apples. *Write* the number on this paper."**
- Allow the student to touch the pictures on the page.
- If the student counts incorrectly, but correctly writes the number he or she says, score *p (partially correct)*.



Moving through the assessment

Incorrect: Turn the page.

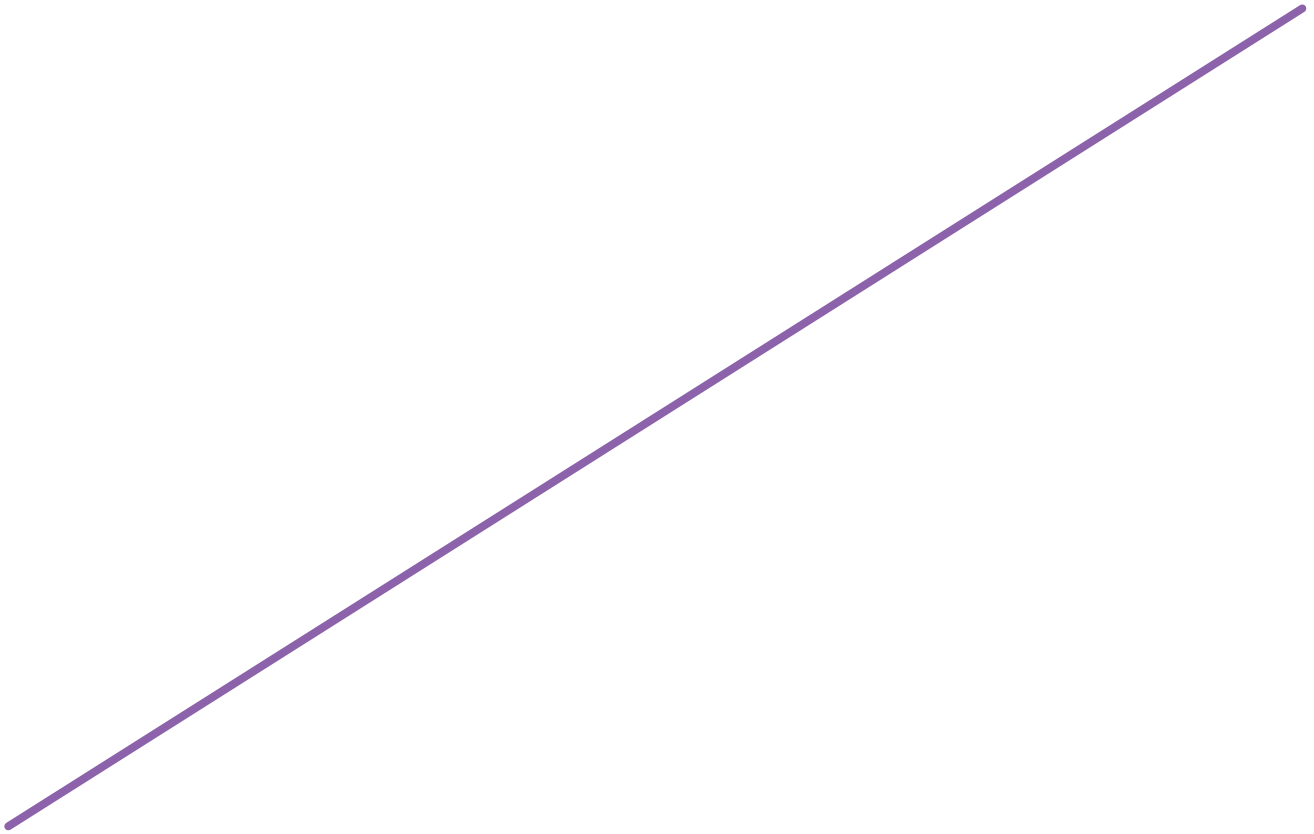
Materials available

Correct response

Writes "14"

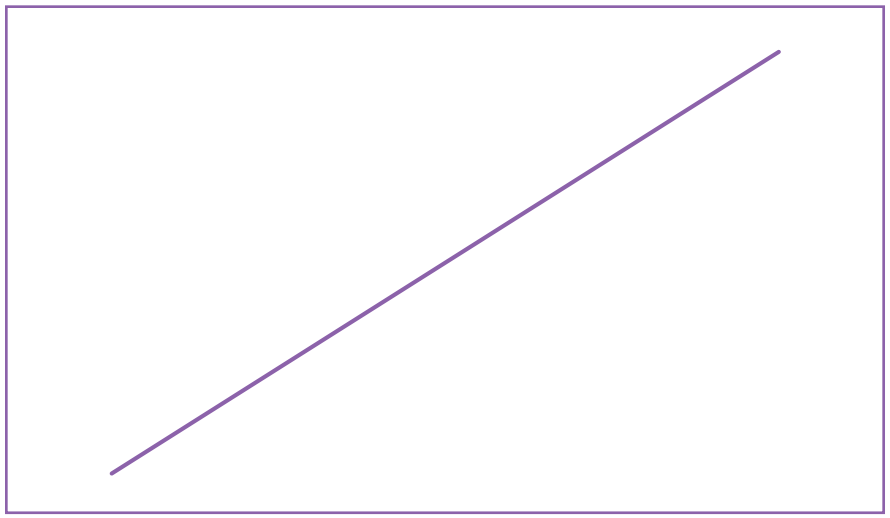
Student's page

Which Is Longer?



Which Is Longer?

- Ball or coil the precut string (length: 9 inches). Hand it to the student.
- Say, **"Which is longer, this string or the line on this page?"**



Moving through the assessment

Incorrect: Skip to item K14 or stop at end of Section 1.

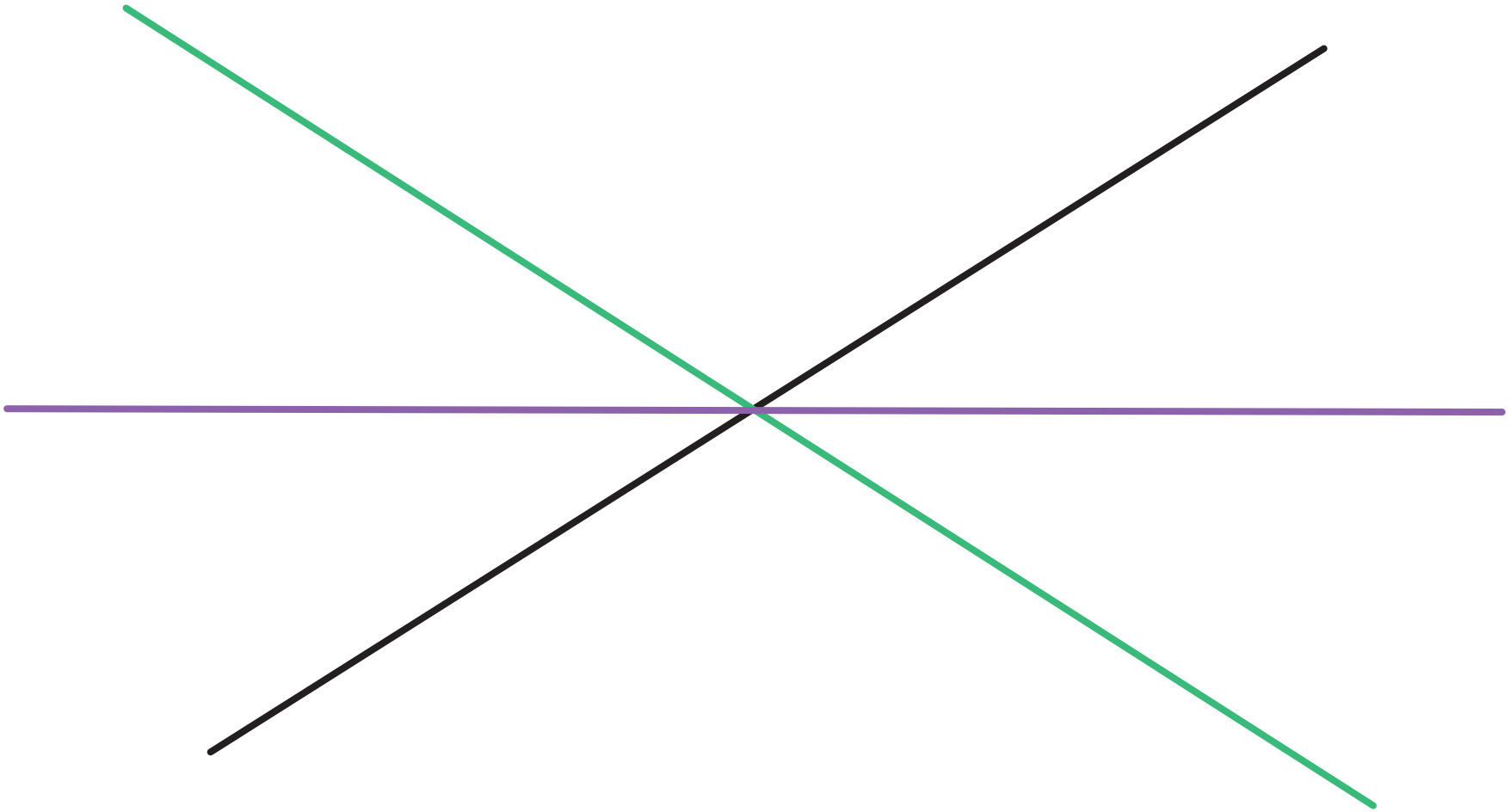
Materials available

Correct response

String

Student's page

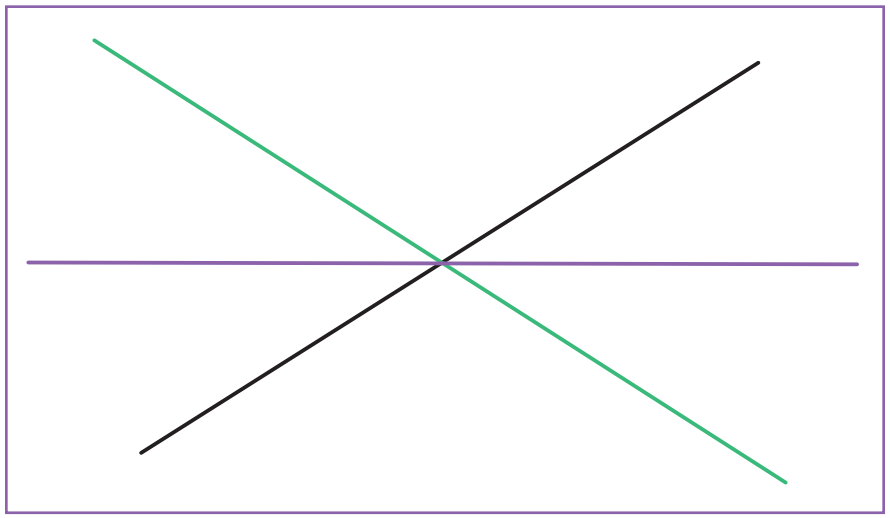
Which Are the Same Length?



Teacher's page

Which Are the Same Length?

- Say, **"There are three lines on this page. Which lines are the same length?"**
- Say, **"You may use the string, linking cubes, or another tool to help you."**



Moving through the assessment

End of Section 1.

Materials available

Correct response

Green and purple lines

End of Section 1

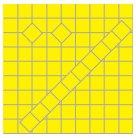
Section 2

Materials needed

- Paper and writing tool for the student

- A supply of about 25 linking cubes (loose)

- A supply of base-ten blocks (1 flat, 10 longs, 10 units)



- Prepared number cards (item K24)

Student's page

How Many Crayons?

I had 3 crayons.
My friend gave me 2 more crayons.
Now how many crayons do I have?

Teacher's page

How Many Crayons?

- Read the problem aloud.

I had 3 crayons.
My friend gave me 2 more crayons.
Now how many crayons do I have?

Moving through the assessment

Incorrect: Skip to item K16.

Materials available

Correct response

5 (crayons)

Student's page

How Many Apples?

Mom had 3 apples.
She bought 6 more apples.
Now how many apples does Mom have?

How Many Apples?

- Read the problem aloud.

Mom had 3 apples.
She bought 6 more apples.
Now how many apples does Mom have?

Moving through the assessment

Incorrect: Turn the page.

Materials available

Correct response

9 (apples)

Student's page

How Many Birds?

I saw 6 birds on the roof.
Two flew away.
How many birds are still on the roof?

Teacher's page

How Many Birds?

- Read the problem aloud.

I saw 6 birds on the roof.
Two flew away.
How many birds are still on the roof?

Moving through the assessment

Incorrect: Skip to item K18.

Materials available

Correct response

4 (birds)

Student's page

How Many Cars?

There were 8 cars in the parking lot.
Five of them drove away.
How many cars are in the parking lot now?

How Many Cars?

- Read the problem aloud.

There were 8 cars in the parking lot.
Five of them drove away.
How many cars are in the parking lot now?

Materials available

Moving through the assessment

Incorrect: Turn the page.

Correct response

3 (cars)

Student's page

How Many People?

There are 3 adults and 6 children at the park.
How many people are at the park?

How Many People?

- Read the problem aloud.

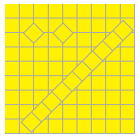
There are 3 adults and 6 children at the park. How many people are at the park?

Moving through the assessment

Incorrect: Turn the page.

Materials available





Correct response

9 (people)

Student's page

How Many Yellow Shirts?

My sister has 8 shirts. Six of them are blue and the rest are yellow. How many yellow shirts does my sister have?

Teacher's page

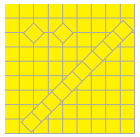
How Many Yellow Shirts?

- Read the problem aloud.

My sister has 8 shirts. Six of them are blue and the rest are yellow. How many yellow shirts does my sister have?

Materials available





Moving through the assessment

Incorrect: Turn the page.

Correct response

2 (yellow shirts)

Student's page

How Many Stickers?

I had 8 stickers. I gave some to my friend. Now I have 3 stickers. How many stickers did I give to my friend?

Teacher's page

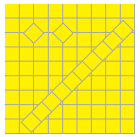
How Many Stickers?

- Read the problem aloud.

I had 8 stickers. I gave some to my friend. Now I have 3 stickers. How many stickers did I give to my friend?

Materials available





Moving through the assessment

Incorrect: Turn the page.

Correct response

5 (stickers)

Student's page

How Many More Goats?

There are 10 horses and 4 goats on the farm. How many more goats should the farmer buy so that there will be the same number of goats and horses?

Teacher's page

How Many More Goats?

- Read the problem aloud.

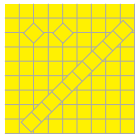
There are 10 horses and 4 goats on the farm. How many more goats should the farmer buy so that there will be the same number of goats and horses?

Moving through the assessment

Incorrect: Turn the page.

Materials available



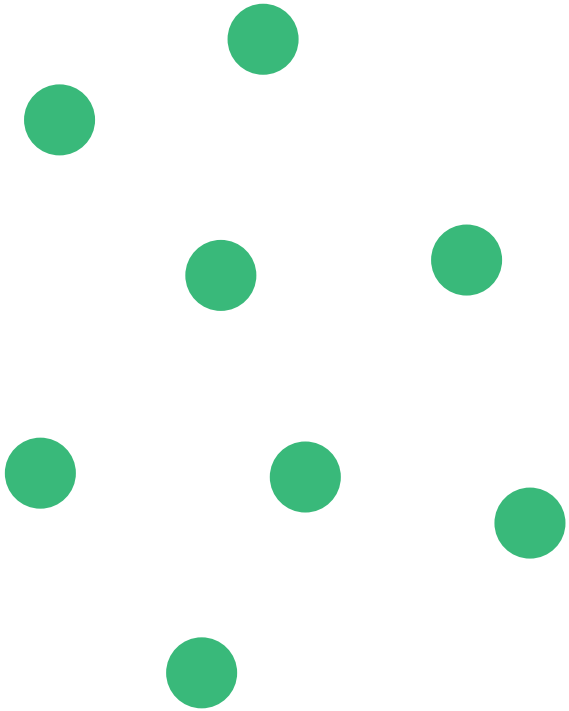


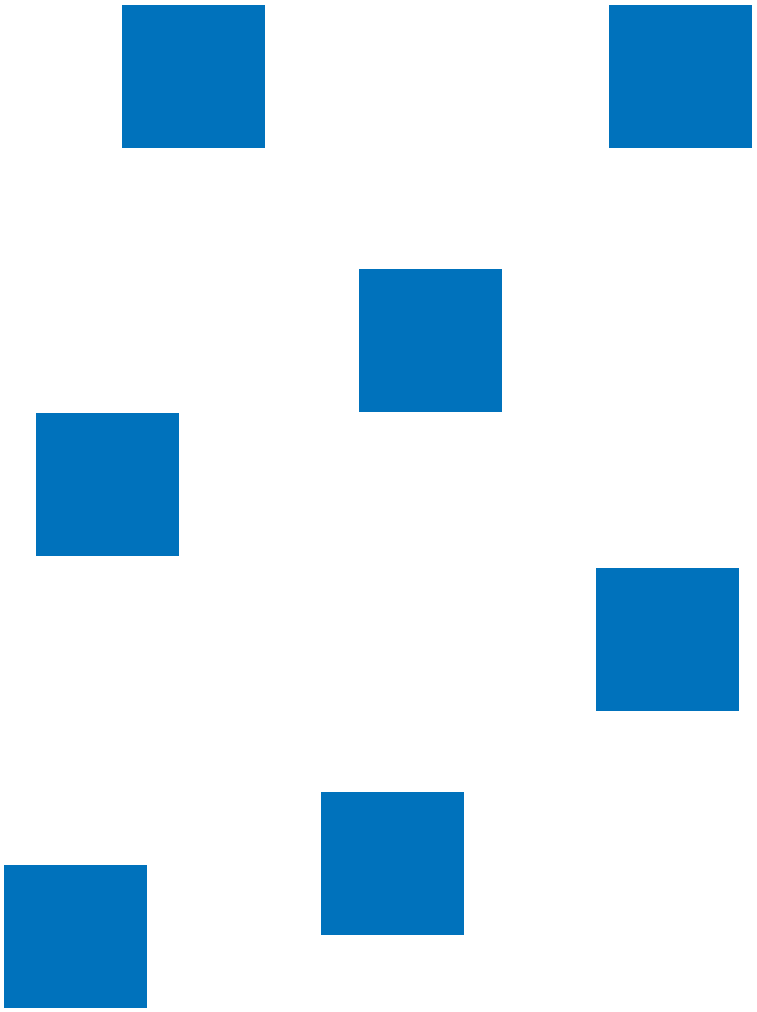
Correct response

6 (more goats)

Student's page

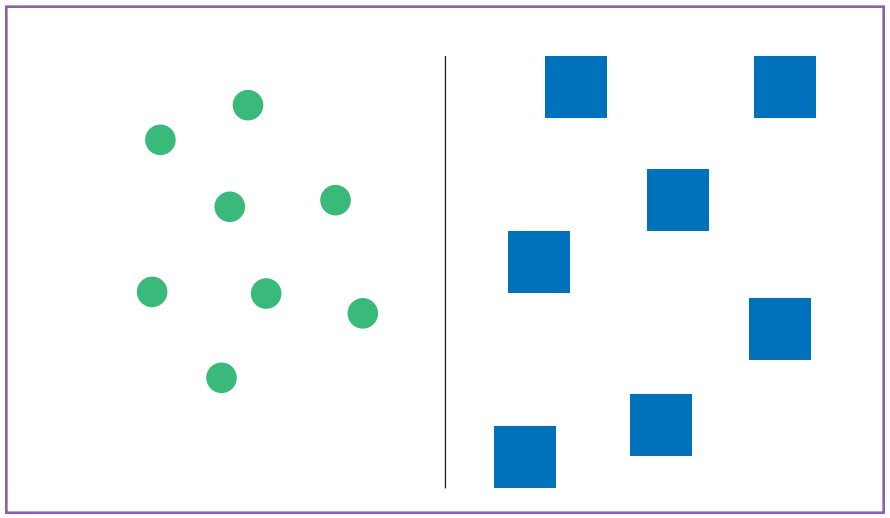
Which Side Has More?





Which Side Has More?

- Say, **"Which side has more shapes? The side with green circles or the side with blue squares?"**



Moving through the assessment

Incorrect: Turn the page.

Materials available

Correct response

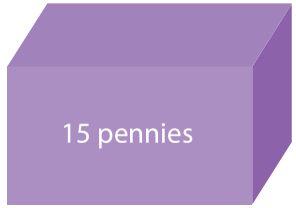
Green (left side)

Which Has More?

15 pennies

Which Has More?

- Say, **"There are pennies outside the box and there are pennies inside the box. Are there more pennies outside or inside the box?"**



Moving through the assessment

Incorrect: Turn the page.

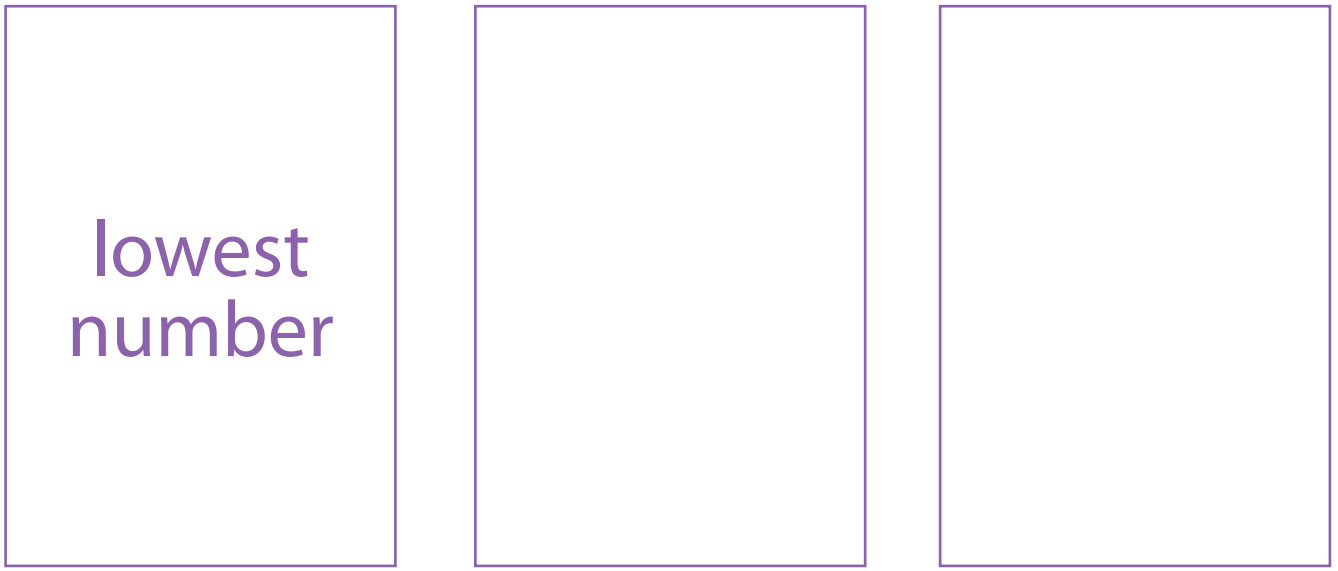
Materials available

Correct response

More pennies inside the box

Student's page

Place the Cards in Order



Teacher's page

Place the Cards in Order

- Hand the student the three purple cards.
- Say, **"Place these cards in number order. Put the lowest (smallest) number here** (point to the spot), **the middle number here** (point), **and the highest (largest) number here** (point)."

Moving through the assessment

End of Section 2.

Materials available

prepared number cards

Correct response

4, 7, 8

End of Section 2

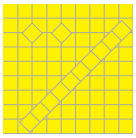
Section 3

Materials needed

- Paper and writing tool for the student

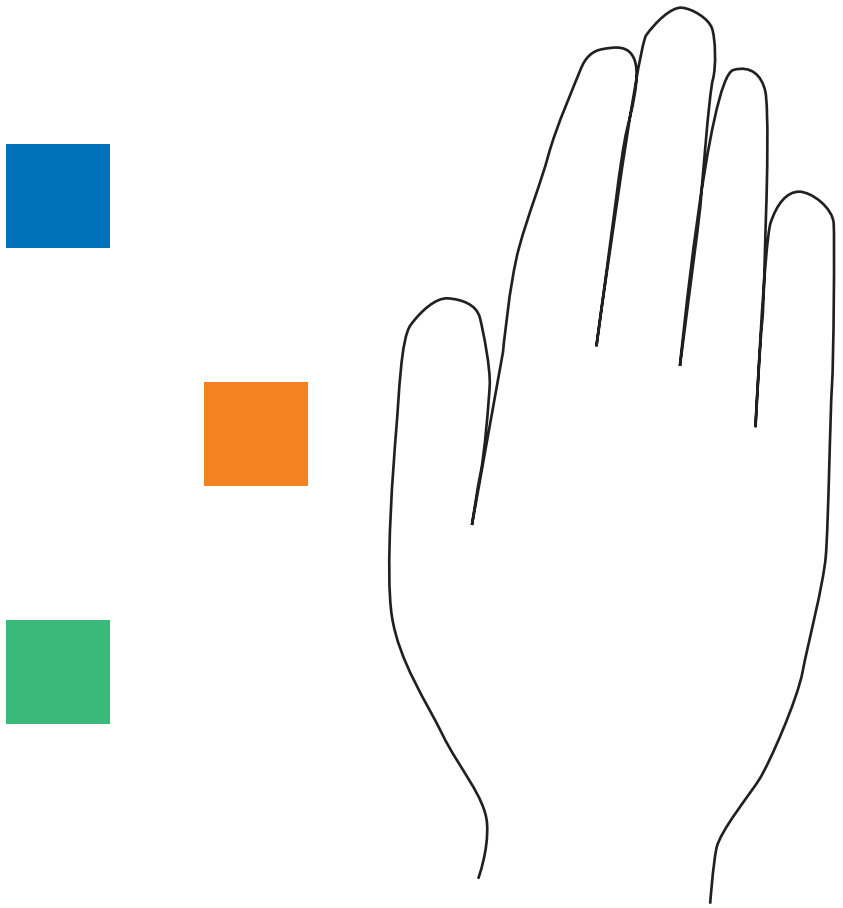
- A supply of about 25 linking cubes (loose)

- A supply of base-ten blocks (1 flat, 10 longs, 10 units)



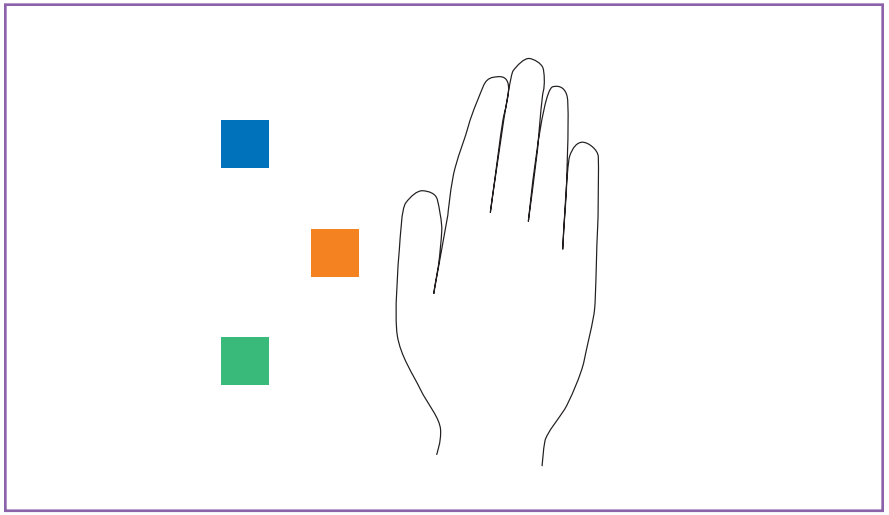
- Prepared triangles (item K35)

What's Hidden?



What's Hidden?

- Say, **"There are five squares on the page. Some of them are hidden under the hand. How many squares are hidden under the hand?"**
- Act out the situation using cubes if the question is unclear to the student.



Moving through the assessment

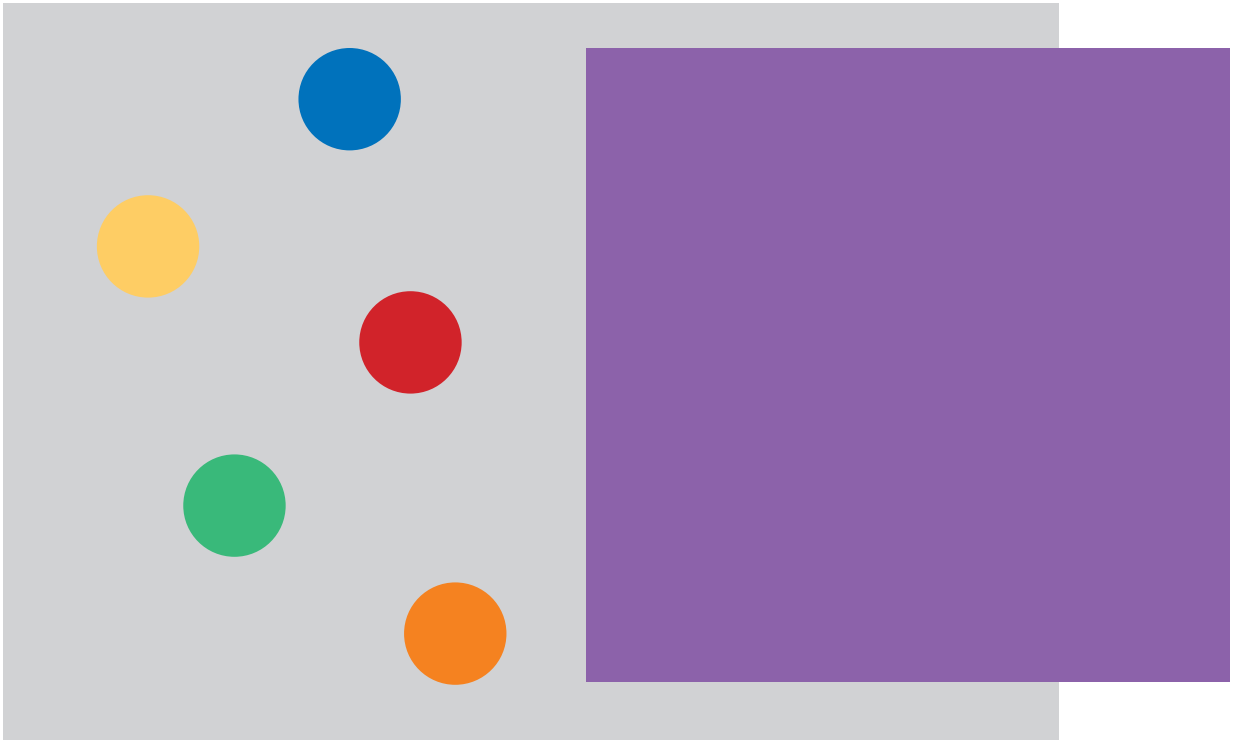
Incorrect: Skip to item K27.

Materials available

Correct response

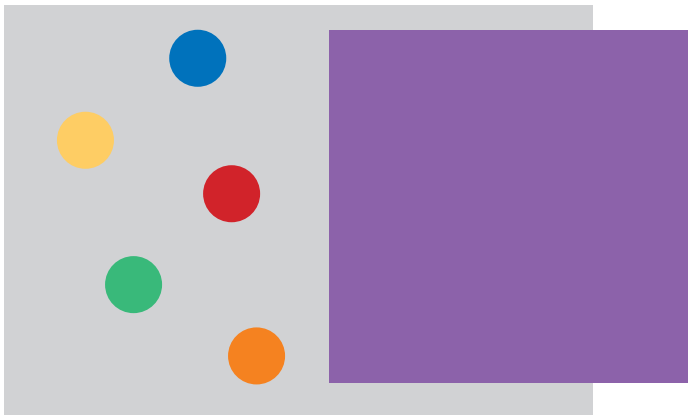
2 (squares)

What's Hidden?



What's Hidden?

- Say, **"There are nine marbles on the gray mat. The purple paper is hiding some of the marbles. How many marbles are hidden under the paper?"**
- Act out the situation using objects if the question is unclear to the student.



Moving through the assessment

Incorrect: Turn the page.

Materials available

Correct response

4 (marbles)

Student's page

What's the Answer?

$$2 + 2 = \square$$

What's the Answer?

- Say, **"What is 2 plus 2?"**
- You may also say,
  - **"What is 2 and 2?"** or
  - **"What number is 2 more than 2?"**

$$2 + 2 = \square$$

Moving through the assessment

Incorrect: Turn the page.

Materials available

Correct response

4

Student's page

What's the Answer?

$$2 + 3 = \square$$

Teacher's page

What's the Answer?

- Say, **"What is 2 plus 3?"**
- You may also say,
  - **"What is 2 and 3?"** or
  - **"What number is 3 more than 2?"**

$$2 + 3 = \square$$

Moving through the assessment

Incorrect: Turn the page.

Materials available

Correct response

5

Student's page

What's the Answer?

$$4 - 2 = \square$$

Teacher's page

What's the Answer?

- Say, **"What is 4 minus 2?"**
- You may also say,
  - **"What is 4 take away 2?"** or
  - **"What number is 2 less than 4?"**

$$4 - 2 = \square$$

Moving through the assessment

Incorrect: Turn the page.

Materials available

Correct response

2

Student's page

Show This Amount

Fourteen

Teacher's page

Show This Amount

- Place base-ten blocks and linking cubes within easy reach.
- Say, **"Show this amount using these materials. Use the materials to show me the tens and the ones."**

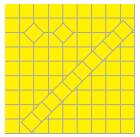
Fourteen

Moving through the assessment

Incorrect: Turn the page.

Materials available





Correct response

Using base-ten blocks: 1 long and 4 units
Using linking cubes: 10 cubes connected and 4 loose cubes

Student's page

Write the Number

5 ones and 1 ten

Write the Number

- Hand the student paper and a writing tool.
- Say, **"Write the number that is made of 5 ones and 1 ten."**

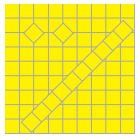
5 ones and 1 ten

Moving through the assessment

Incorrect: Turn the page.

Materials available





Correct response

Writes "15"

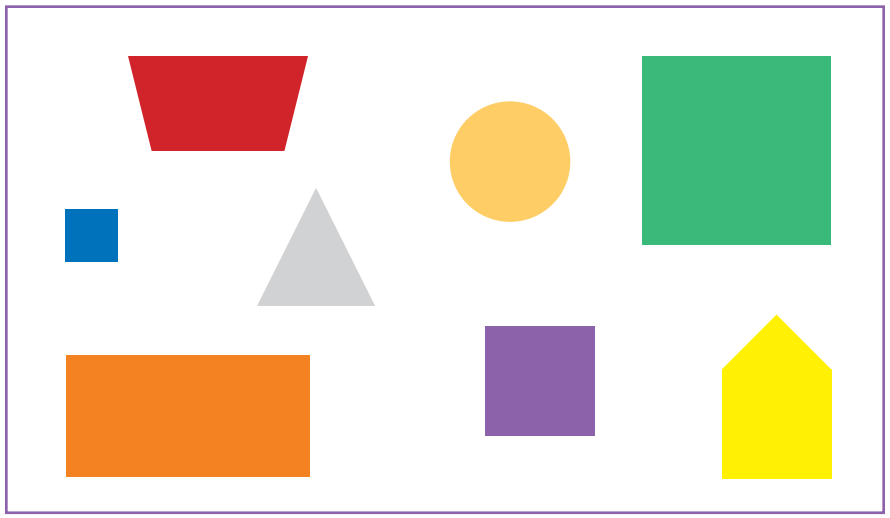
Student's page

Point to the Squares

Teacher's page

Point to the Squares

- Say, **"Show me a square."**
- Say, **"Can you find another square?"**
- Repeat the question until the student says there are no more squares.



Materials available

none

Moving through the assessment

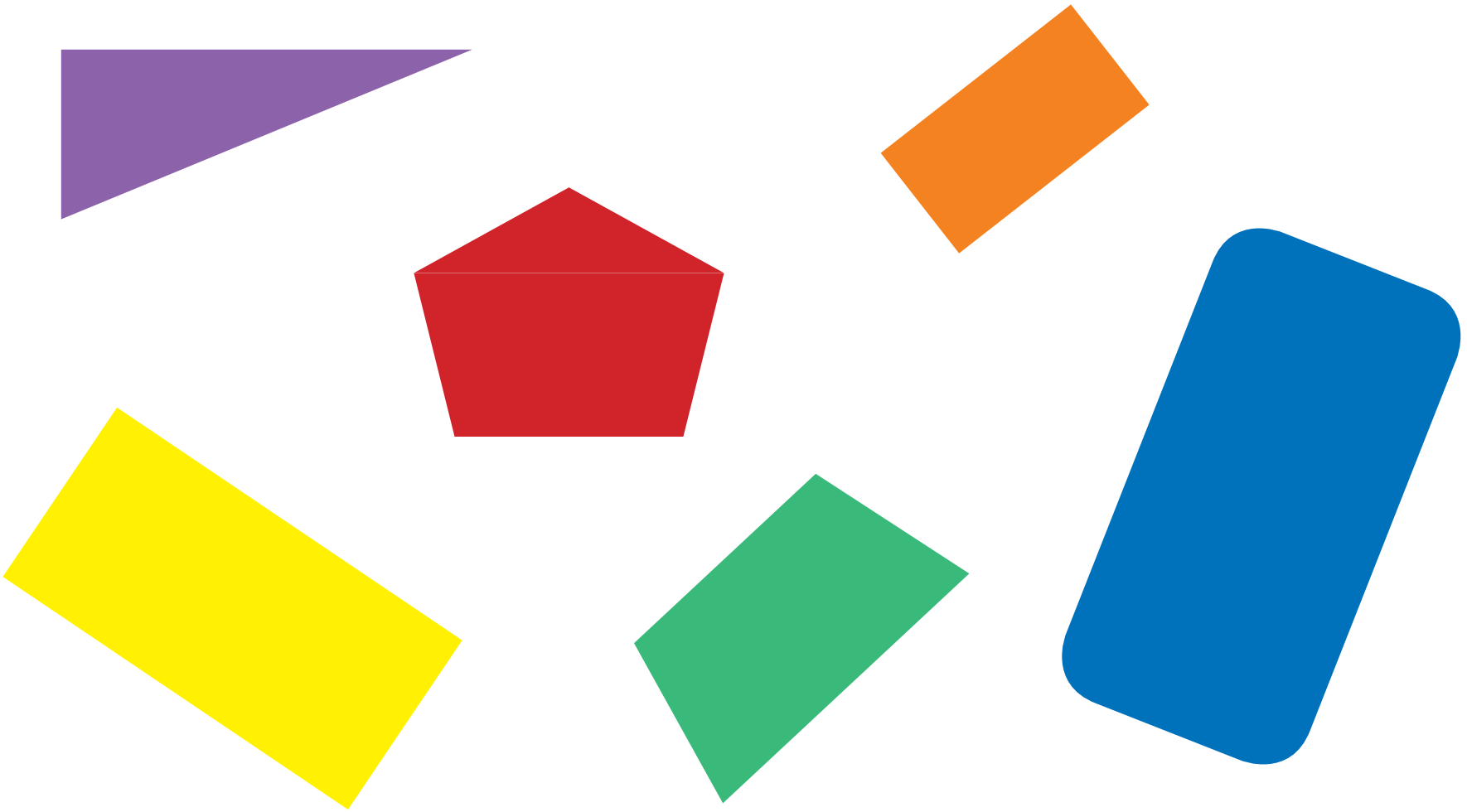
Incorrect: Turn the page.

Correct response

Blue, green, and purple squares

Student's page

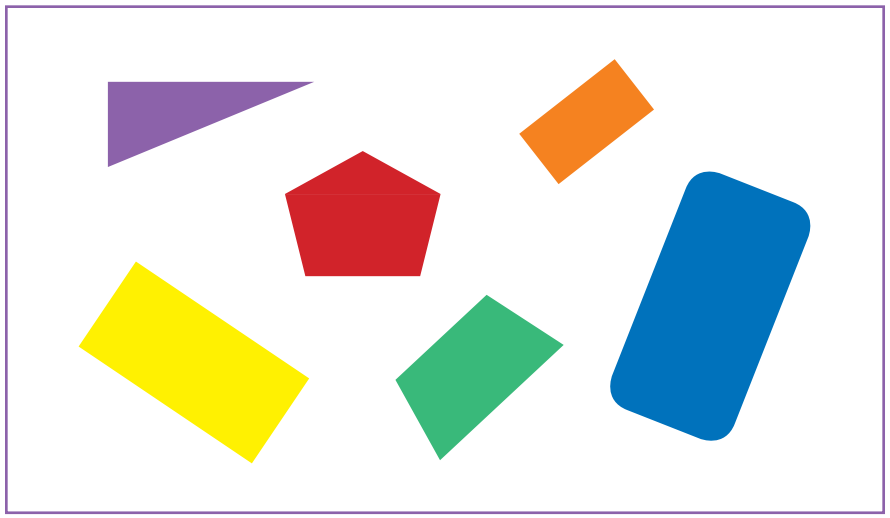
Point to the Rectangles



Teacher's page

Point to the Rectangles

- Say, **"Show me a rectangle."**
- Say, **"Can you find another rectangle?"**
- Repeat the question until the student says there are no more rectangles.



Moving through the assessment

Incorrect: Turn the page.

Materials available

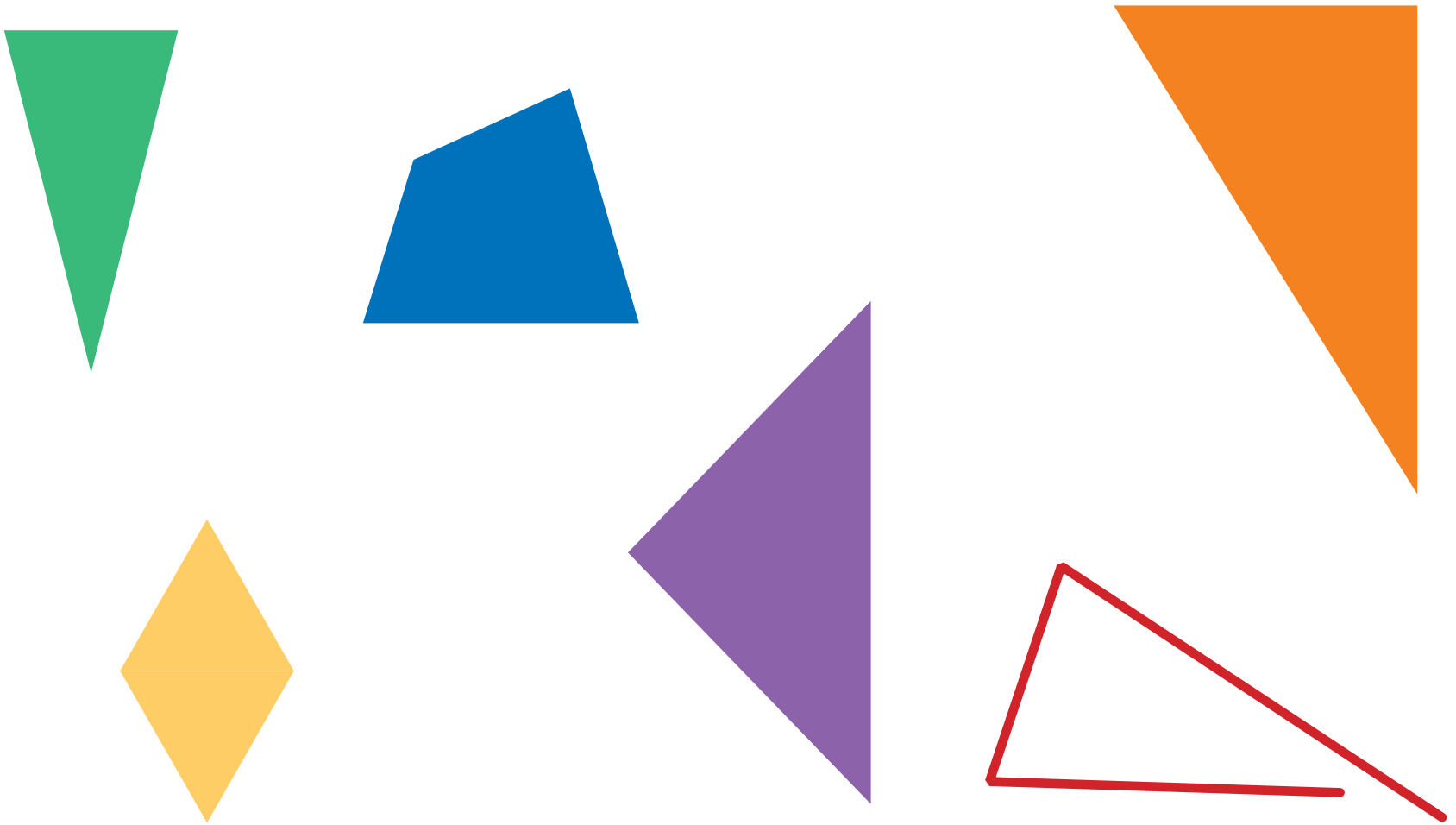
none

Correct response

Yellow and orange rectangles

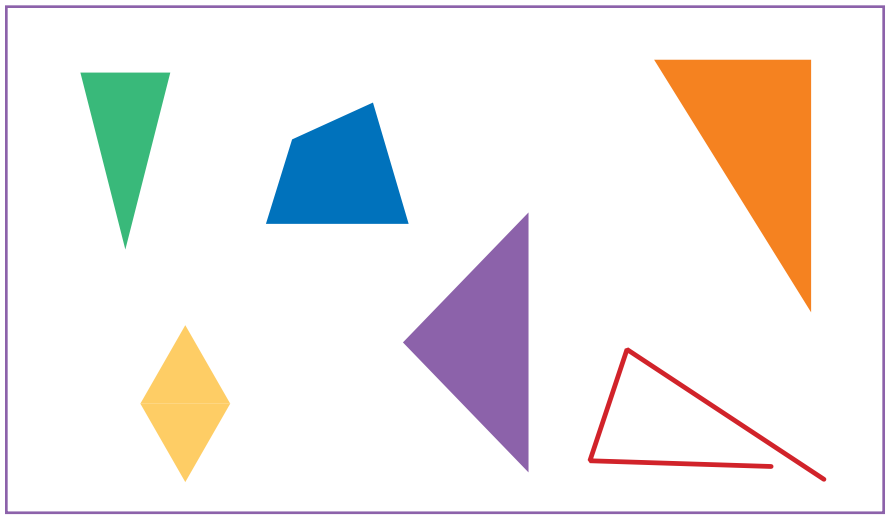
Student's page

Point to the Triangles



Point to the Triangles

- Say, **"Show me a triangle."**
- Say, **"Can you find another triangle?"**
- Repeat the question until the student says there are no more triangles.



Moving through the assessment

Incorrect: Turn the page.

Materials available

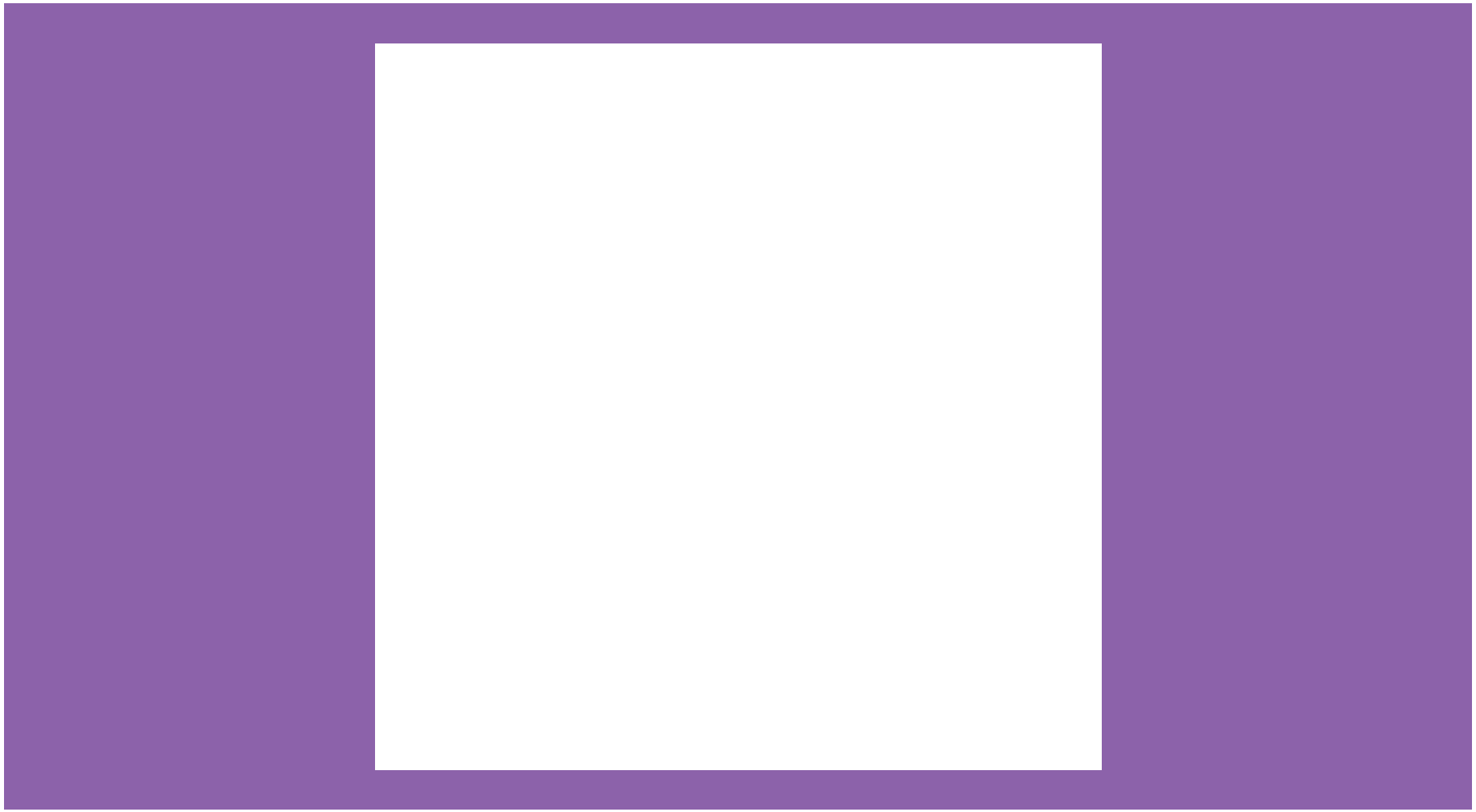
none

Correct response

Purple, green, and orange triangles

Student's page

Fill the White Space



Teacher's page

Fill the White Space

- Hand the student three triangles.
- Say, **"Can you fill the white space with these pieces?"**
- If the student is struggling say, **"Start with the large triangle here"** and put the large triangle in place.
- If the student solves it with this help, score *p (partially correct)*.

Moving through the assessment

End of Section 3.

Materials available

prepared triangles

Correct response

Fills space exactly (in any orientation)

End of Section 3

CREATING STRONG
SCHOOLS & COMMUNITIES

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