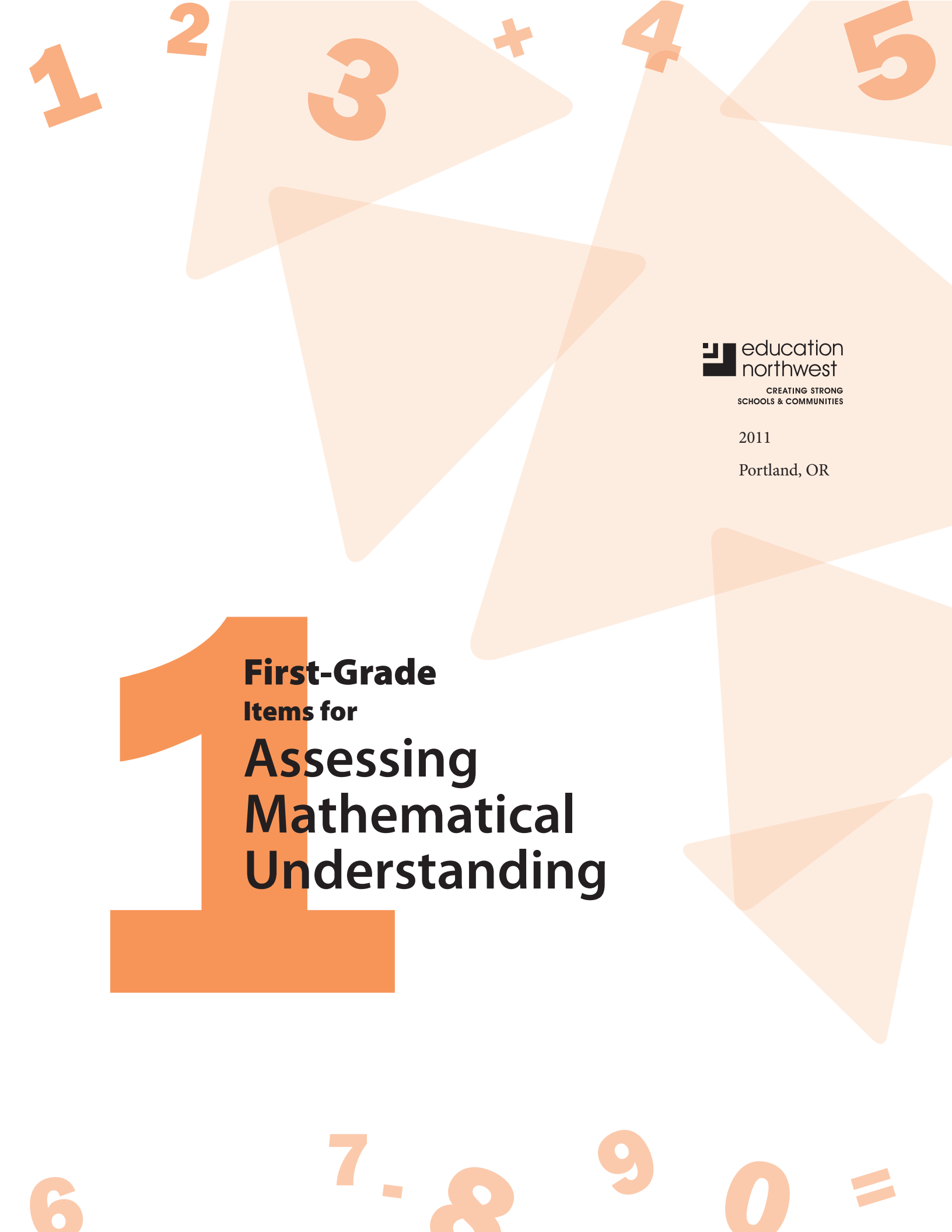
First-Grade Items for Assessing Mathematical Understanding

education northwest
CREATING STRONG SCHOOLS & COMMUNITIES



education northwest
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2011

Portland, OR

First-Grade Items for Assessing Mathematical Understanding

Education Northwest
101 SW Main St, Suite 500
Portland, OR 97204
503.275.9500
educationnorthwest.org

ISBN 978-089354-121-4

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.

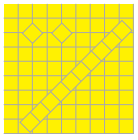
Advance Preparation

Materials needed

- Paper and writing tool for the student

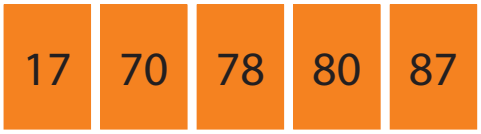
- A supply of about 60 linking cubes
  - 40 cubes arranged in sticks of 10 cubes each
  - 20 loose cubes

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



- Prepare yellow number cards (see page 5, for section 1, item F2)

- Prepare orange number cards (see page 5, for section 1, item F3)

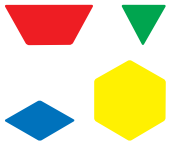


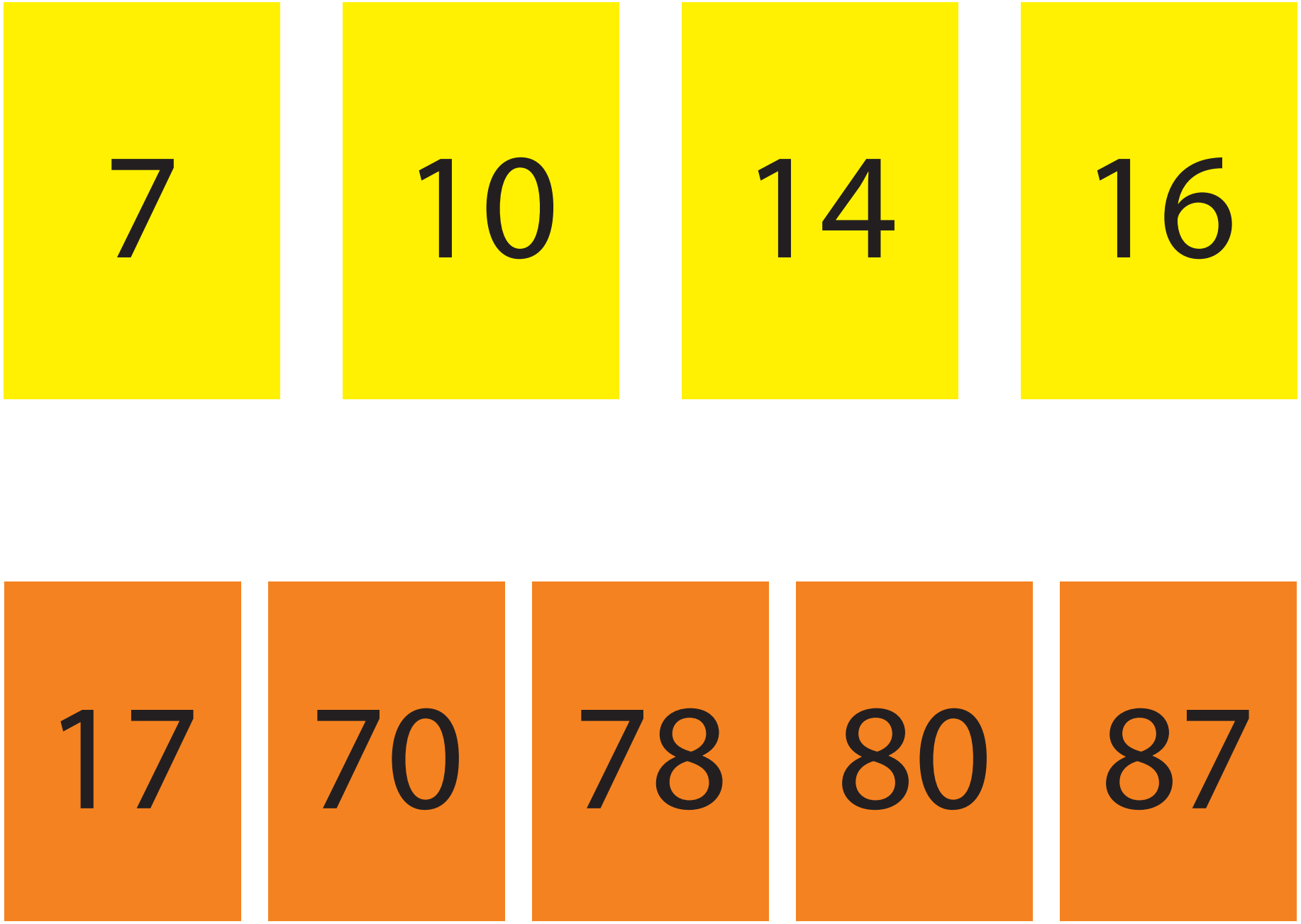
- A supply of about 12 small, uniform-sized paperclips (item F12)

- One large paperclip (item F13)

- Prepare triangles (see page 6, for section 2, item F15)

- Pattern blocks (at least 6 triangles, 6 rhombi, 4 trapezoids, 2 hexagons, for section 2, item F16)

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16
17
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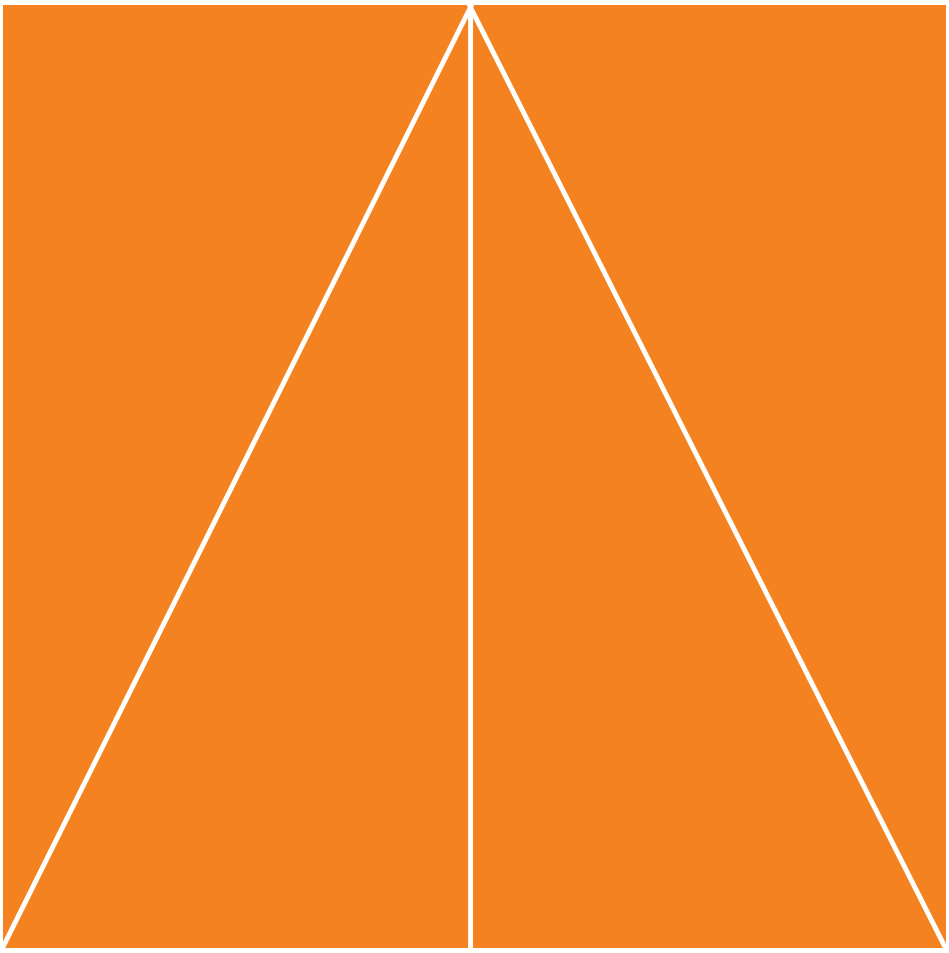
78
80
87



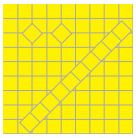
Section 1

Materials needed

- Paper and writing tool for the student

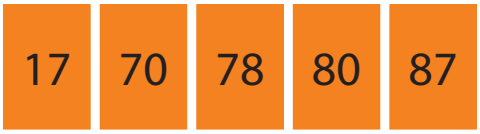
- A supply of about 60 linking cubes
  - 40 cubes arranged in sticks of 10 cubes each
  - 20 loose cubes

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



- Yellow number cards (item F2)

- Orange number cards (item F3)



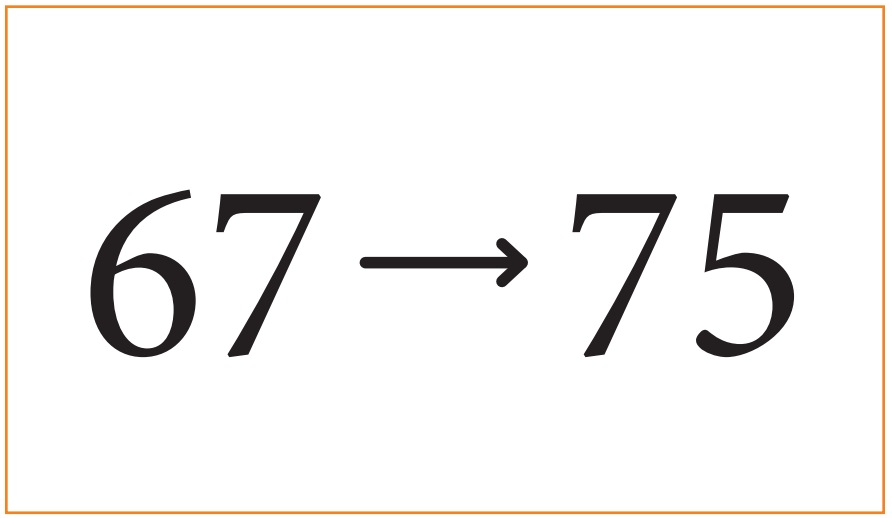
Student's page

Count From 67 to 75

67 → 75

Count From 67 to 75

- Say, **"Count from 67 to 75."**
- If necessary, use this prompt: **"Say 67."**
- Wait for the student to say "67."
- Say, **"Now keep counting up from 67 until you reach 75."**



Moving through the assessment

Incorrect: Turn the page.

Materials available

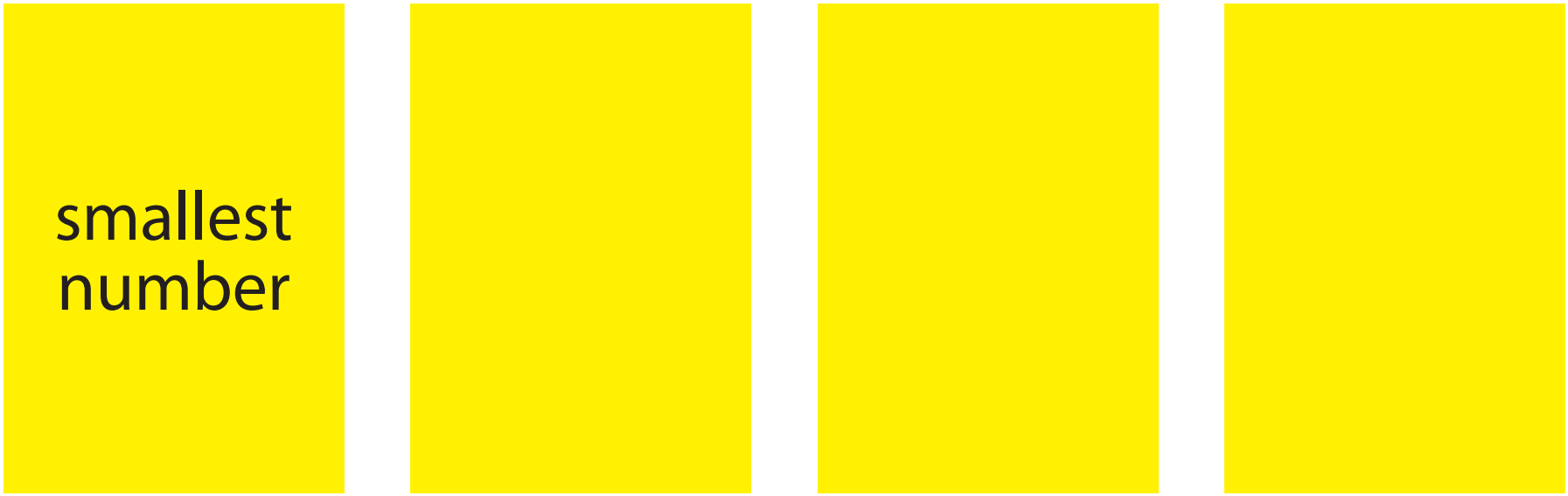
none

Correct response

67, 68, 69, 70, 71, 72, 73, 74, 75

Student's page

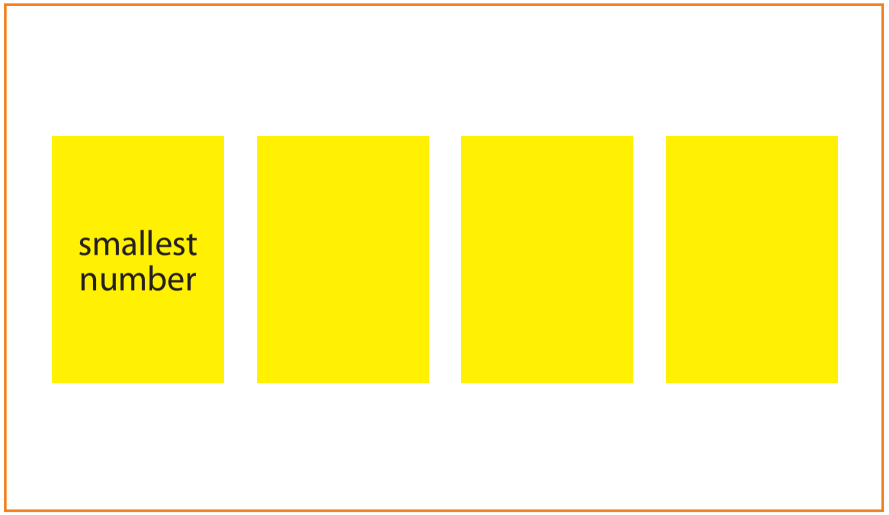
Place the Cards in Order



Teacher's page

Place the Cards in Order

- Hand the student the yellow number cards.
- Say, **"Place these cards in number order."**



Moving through the assessment

Incorrect: Skip to item F4.

Materials available

prepared number cards: 16, 10, 7, 14

Correct response

7, 10, 14, 16

Student's page

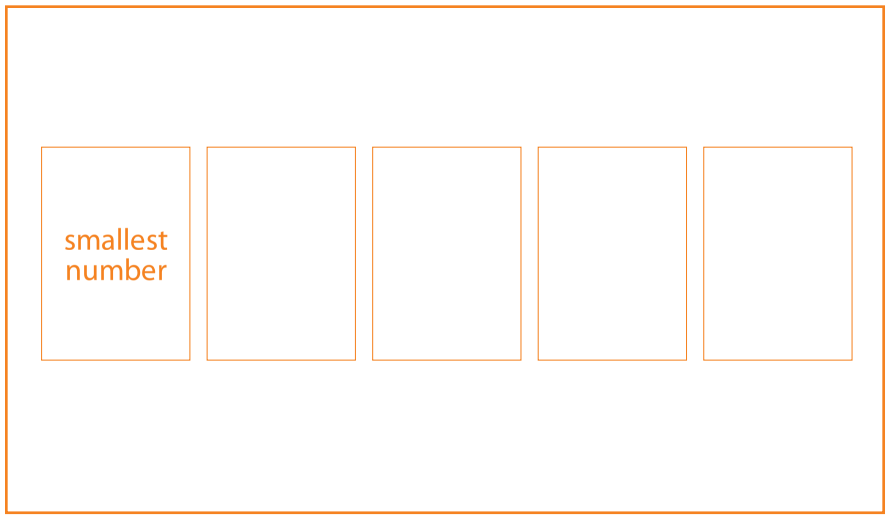
Place the Cards in Order

smallest number				

Teacher's page

Place the Cards in Order

- Hand the student the orange number cards.
- Say, **"Place these cards in number order."**



Moving through the assessment

Incorrect: Turn the page.

Materials available

prepared number cards: 87 78 80 70 17

Correct response

17, 70, 78, 80, 87

Student's page

How Many Carrots?

Dad had 9 carrots.
He bought 4 more carrots.
Now how many carrots does Dad have?

Teacher's page

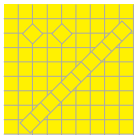
How Many Carrots?

- Read the problem aloud.

Dad had 9 carrots.
He bought 4 more carrots.
Now how many carrots does Dad have?

Materials available



Moving through the assessment

Incorrect: Turn the page.

Correct response

13 (carrots)

Student's page

How Many Cookies?

There were 11 cookies on the plate.
We took 6 of them.
How many cookies are on the plate now?

How Many Cookies?

- Read the problem aloud.

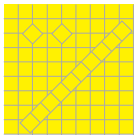
There were 11 cookies on the plate.
We took 6 of them.
How many cookies are on the plate now?

Moving through the assessment

Incorrect: Turn the page.

Materials available



Correct response

5 (cookies)

Student's page

How Many Coins?

I have 8 pennies in 1 pocket and 9 pennies in the other pocket. How many pennies do I have in my pockets?

Teacher's page

How Many Coins?

- Read the problem aloud.

I have 8 pennies in one pocket and 9 pennies in the other pocket. How many pennies do I have in my pockets?

Moving through the assessment

Incorrect: Turn the page.

Materials available

Correct response

17 (pennies)

Student's page

How Many Girls?

There are 13 players on my soccer team. Five of them are boys and the rest of them are girls. How many girls are on my soccer team?

Teacher's page

How Many Girls?

- Read the problem aloud.

There are 13 players on my soccer team. Five of them are boys and the rest of them are girls. How many girls are on my soccer team?

Moving through the assessment

Incorrect: Turn the page.

Materials available

Correct response

8 (girls)

Student's page

How Many Pencils?

There were 11 pencils in my backpack. On my way to school I lost some of them. Now I only have 7 pencils in my backpack. How many pencils did I lose?

Teacher's page

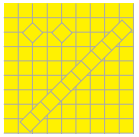
How Many Pencils?

- Read the problem aloud.

There were 11 pencils in my backpack.
On my way to school I lost some of them.
Now I only have 7 pencils in my backpack.
How many pencils did I lose?

Materials available



Moving through the assessment

Incorrect: Turn the page.

Correct response

4 (pencils)

Student's page

How Many More Peach Trees?

A farmer planted 16 apple trees and 9 peach trees. How many more peach trees should the farmer plant so there will be the same number of peach trees and apple trees?

Teacher's page

How Many More Peach Trees?

- Read the problem aloud.

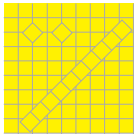
A farmer planted 16 apple trees and 9 peach trees. How many more peach trees should the farmer plant so there will be the same number of peach trees and apple trees?

Moving through the assessment

Incorrect: Turn the page.

Materials available



Correct response

7 (more peach trees)

Student's page

How Many Birds?

There were some birds in a tree. Eight of them flew away. Now there are 3 birds in the tree. How many birds were in the tree to start?

How Many Birds?

- Read the problem aloud.

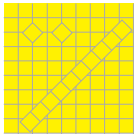
There were some birds in a tree. Eight of them flew away. Now there are 3 birds in the tree. How many birds were in the tree to start?

Moving through the assessment

Incorrect: Turn the page.

Materials available



Correct response

11 (birds)

Student's page

How Many Candies?

I had some candies in a bag.

My friend gave me 6 more candies and now I have 14 candies.

How many candies did I have to start?

Teacher's page

How Many Candies?

- Read the problem aloud.

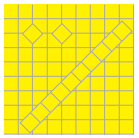
I had some candies in a bag.
My friend gave me 6 more candies and now I have 14 candies.
How many candies did I have to start?

Moving through the assessment

End of Section 1.

Materials available



Correct response

8 (candies)

End of Section 1

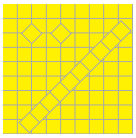
Section 2

Materials needed

- Paper and writing tool for the student

- A supply of about 60 linking cubes
  - 40 cubes arranged in sticks of 10 cubes each
  - 20 loose cubes

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

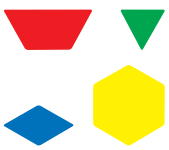


- A supply of about 12 small, uniform-sized paperclips (item F12)

- One large paperclip (item F13)

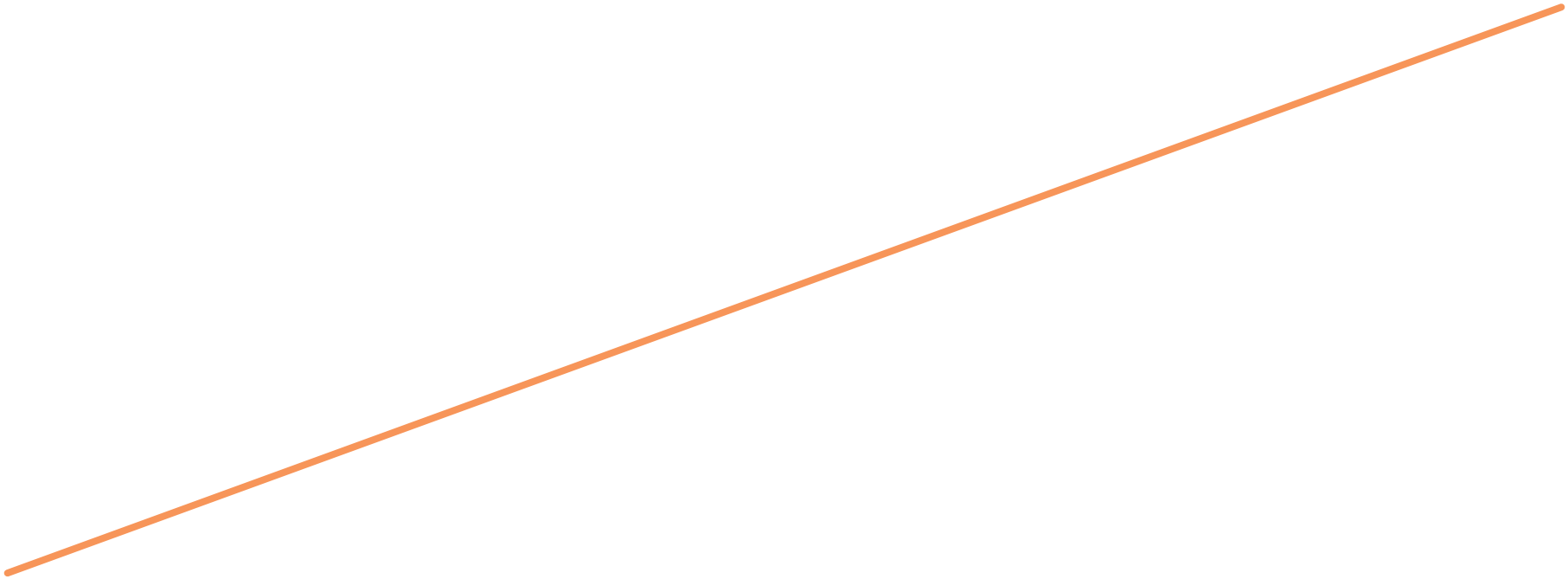
- 4 triangles (item F15)

- Pattern blocks (at least 6 triangles, 6 rhombi, 4 trapezoids, 2 hexagons, item F16)



Student's page

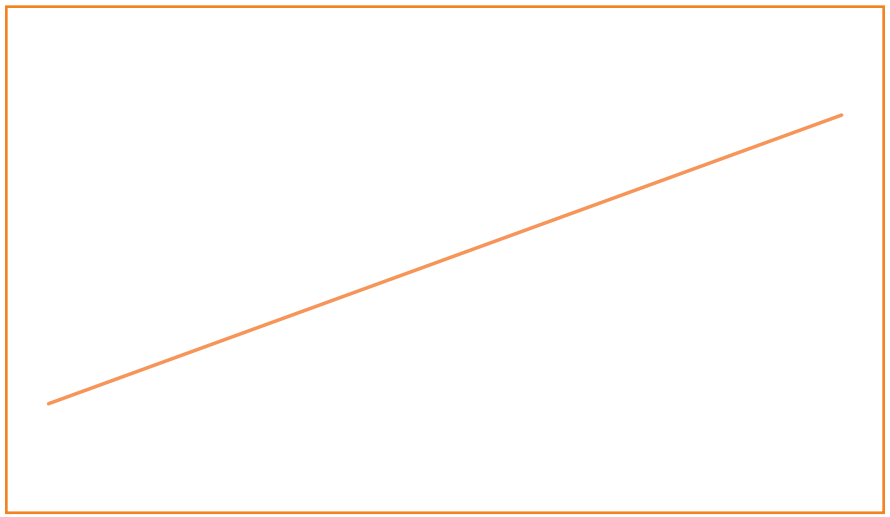
Measure the Line



Teacher's page

Measure the Line

- Hand the student a supply of small paper clips.
- Say, **"Measure the length of this line using these paper clips."**
- Say, **"How long is the line in paper clips?"**



Moving through the assessment

Incorrect: Turn the page.

Materials available

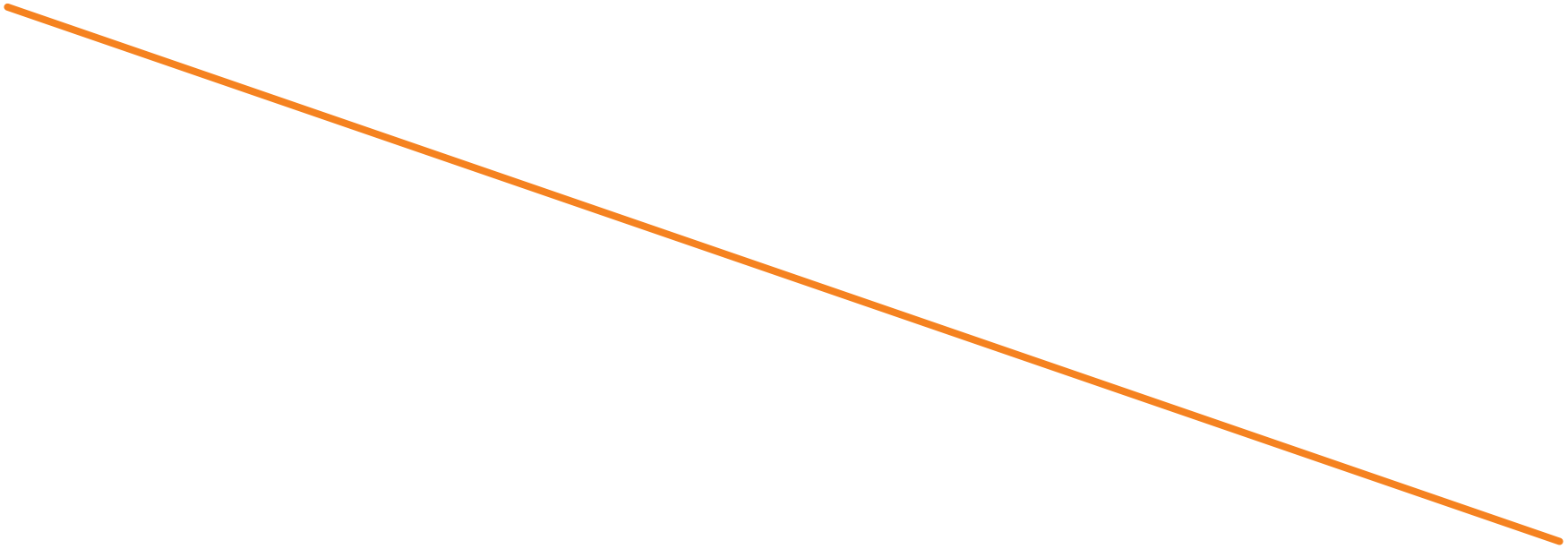
12 small

Correct response

Approximately 8 (depends on size of paper clip)

Student's page

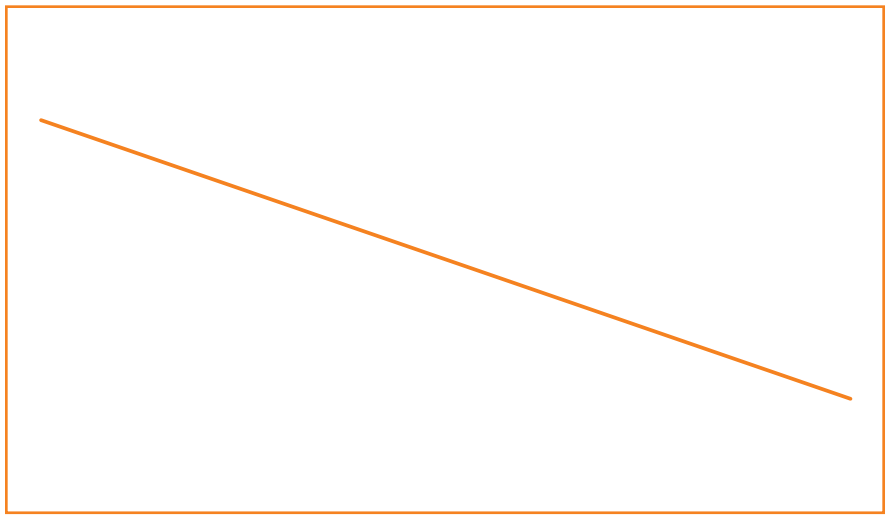
How Long Is the Line?



Teacher's page

How Long Is the Line?

- Hand the student one large paper clip.
- Say, **"Measure the length of this line using this paper clip."**
- Say, **"How long is the line in paper clips?"**



Moving through the assessment

Incorrect: Turn the page.

Materials available

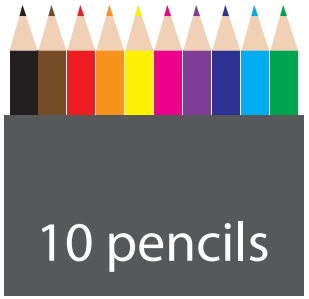
one large 

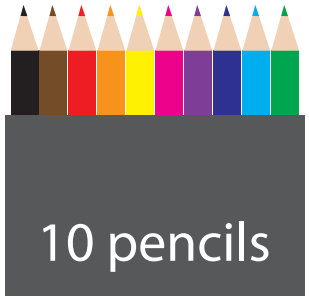
Correct response

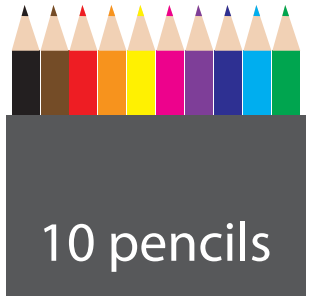
Approximately 5 (depends on the size of the paper clip)

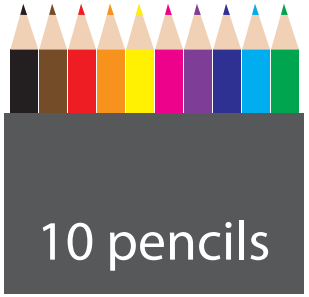
Student's page

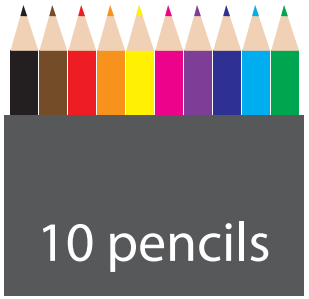
Write the Number of Pencils

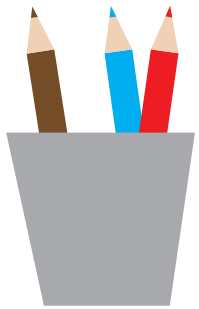








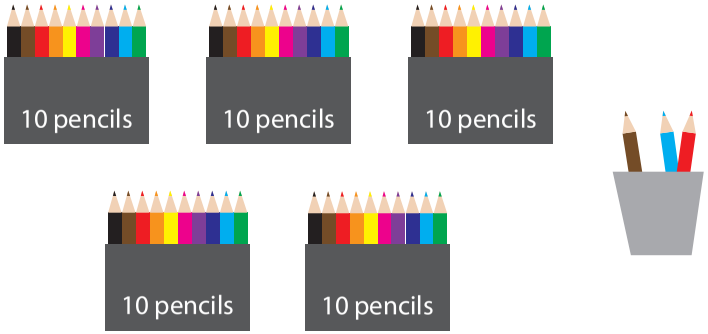




Teacher's page

Write the Number of Pencils

- Say, **"This picture shows some pencils in boxes and some pencils in the cup** (point to the cup). **How many pencils are in this picture. Write the number on this paper."**
- If the student counts all by ones say, **"Can you count a faster way?"**



Materials available

Moving through the assessment

Incorrect: Turn the page.

Correct response

Uses tens and ones and writes "53"

Student's page

Make a Square

Teacher's page

Make a Square

- Hand the student the four triangles.
- Say, **"Use all four of these pieces to make a square."**
- After several seconds say, **"Start by using two pieces to make a rectangle."**
- If the student solves it with this help, score *p (partially correct)*.

Materials available

prepared triangles

Moving through the assessment

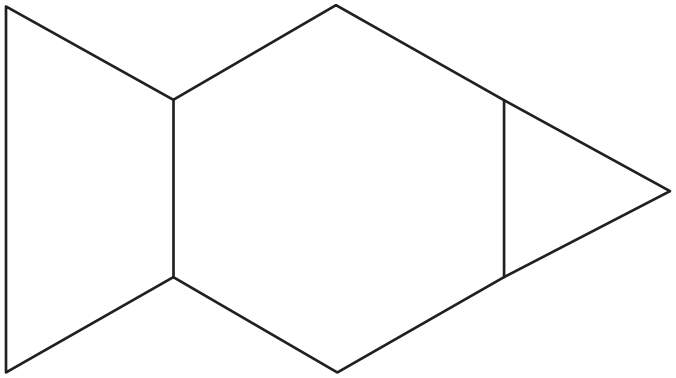
Incorrect: Turn the page.

Correct response

Forms a square using 4 right triangles (in any orientation)

Student's page

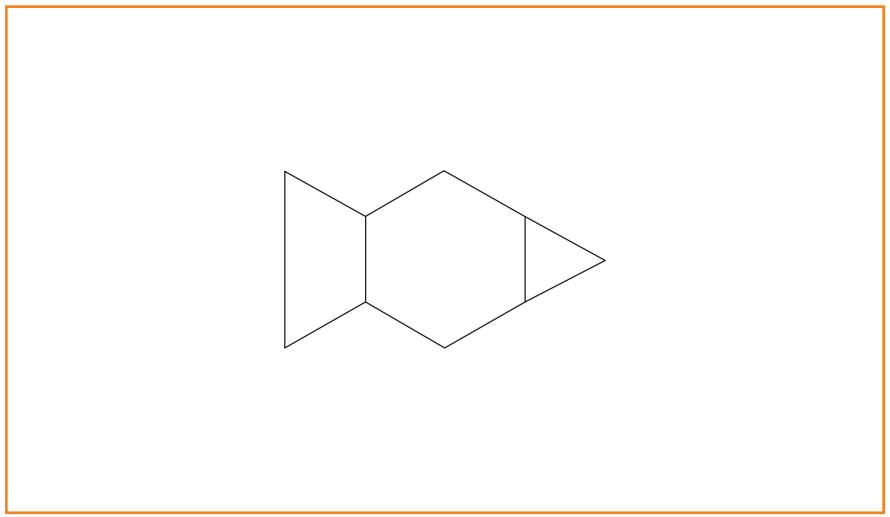
Fill the Frame



Teacher's page

Fill the Frame

- Hand the student a supply of pattern blocks.
- Say, **"Fill the frame with three blocks—one red, one yellow, and one green."**
- Say, **"Now trade some pieces so that you fill the same space using a total of six blocks."**



Moving through the assessment

Incorrect: Turn the page.

Materials available

Correct response

Fills space using 6 blocks

Student's page

What's the Answer?

$$3 + 7 = \square$$

What's the Answer?

- Say, **"What is the answer?"**
- You may also say, **"What is 3 plus 7?"**

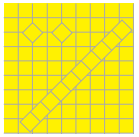
$$3 + 7 = \square$$

Moving through the assessment

Incorrect: Turn the page.

Materials available



Correct response

10

Student's page

What's the Answer?

$$4 + 2 = \square$$

Teacher's page

What's the Answer?

- Say, **"What is 4 plus 2?"**
- You may also say,
  - **"What is 4 and 2?"** or
  - **"What number is 2 more than 4?"**

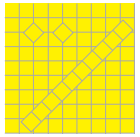
$$4 + 2 = \square$$

Moving through the assessment

Incorrect: Turn the page.

Materials available



Correct response

6

Student's page

What's the Answer?

$$7 - 4 = \square$$

What's the Answer?

- Say, **"What is the answer?"**
- You may also say, **"What is 7 minus 4?"**

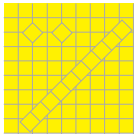
$$7 - 4 = \square$$

Moving through the assessment

Incorrect: Turn the page.

Materials available



Correct response

3

Student's page

What's the Answer?

$$10 - 8 = \square$$

What's the Answer?

- Say, **"What is the answer?"**
- You may also say, **"What is 10 minus 8?"**

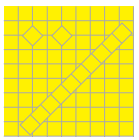
$$10 - 8 = \square$$

Moving through the assessment

Incorrect: Turn the page.

Materials available



Correct response

2

Student's page

What's the Answer?

$$9 - 6 = \square$$

Teacher's page

What's the Answer?

- Say, **"What is 9 minus 6?"**
- You may also say,
  - **"What is 9 takeaway 6?"** or
  - **"What number is 6 less than 9?"**

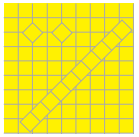
$$9 - 6 = \square$$

Moving through the assessment

End of section 2.

Materials available



Correct response

3

End of Section 2

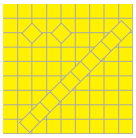
Section 3

Materials needed

- Paper and writing tool for the student

- A supply of about 60 linking cubes
  - 40 cubes arranged in sticks of 10 cubes each
  - 20 loose cubes

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



Student's page

Which Number Sentence?

There were 15 brownies on a plate. Jenna took some brownies. Now there are 6 brownies on the plate. How many brownies did Jenna take?

$15 + 6 = \square$

$15 - \square = 6$

$15 + \square = 6$

Teacher's page

Which Number Sentence?

- Say, **"I will read you a number story. Tell me which number sentence matches it."**
- Read the text and repeat if the student requests.
- If necessary, explain that we do not need to know the answer to the question, just which number sentence matches the word sentence.

There were 15 brownies on a plate. Jenna took some brownies. Now there are 6 brownies on the plate. How many brownies did Jenna take?

$15 + 6 = \square$

$15 - \square = 6$

$15 + \square = 6$

Materials available



Moving through the assessment

Incorrect: Turn the page.

Correct response

$15 - \square = 6$ (middle option)

Student's page

Which Number Sentence?

There were some snakes on a rock. Twelve more snakes came to the rock. Now there are 18 snakes on the rock. How many snakes were on the rock to start?

$12 + 18 = \square$

$\square + 12 = 18$

$\square - 12 = 18$

Teacher's page

Which Number Sentence?

- Say, **"I will read you a number story. Tell me which number sentence matches it."**
- Read the text and repeat if the student requests.
- If necessary, explain that we do not need to know the answer to the question, only which number sentence matches the word sentence.

There were some snakes on a rock. Twelve more snakes came to the rock. Now there are 18 snakes on the rock. How many snakes were on the rock to start?

$12 + 18 = \square$

$\square + 12 = 18$

$\square - 12 = 18$

Materials available



Moving through the assessment

Incorrect: Turn the page.

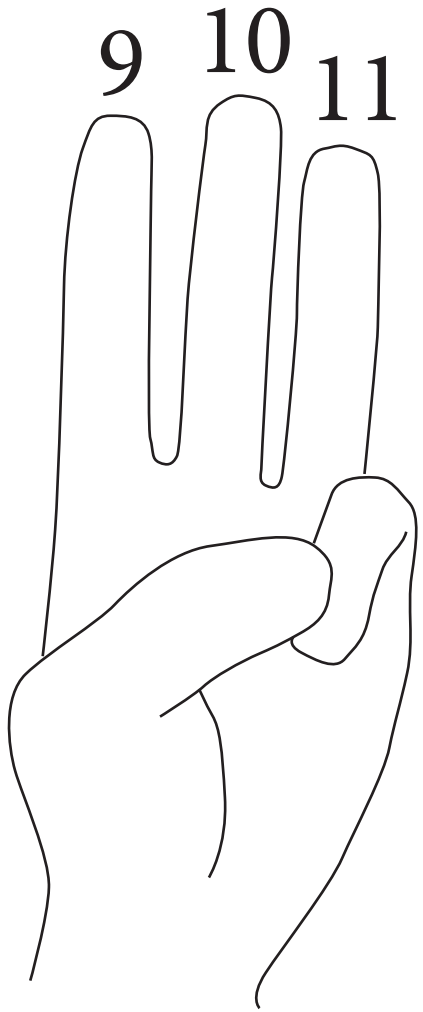
Correct response

$\square + 12 = 18$ (middle option)

Student's page

Which Problem Matches?

8



$8 + 3 = \square$

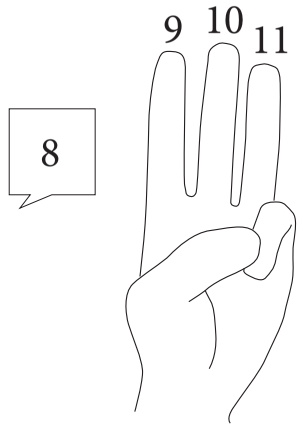
$8 + 11 = \square$

$9 + 3 = \square$

Teacher's page

Which Problem Matches?

- Say, "**My friend was working on one of these math problems. I heard him say '8** (pause)**, 9, 10, 11' using his fingers like this** (act this out). **Which problem was he solving?"**



$8 + 3 = \square$

$8 + 11 = \square$

$9 + 3 = \square$

Moving through the assessment

Incorrect: Turn the page.

Materials available

none

Correct response

$8 + 3 = \square$ (first option)

Student's page

Which Number Sentence?

One of these number sentences is true.
Which one is true?

a) $9 + 5 = 9 - 5$

b) $9 + 5 = 9 + 5 - 5$

c) $9 + 5 = 5 + 9$

Teacher's page

Which Number Sentence?

- Say, **"One of these number sentences is true and the others are false. Which one is true?"**

One of these number sentences is true.
Which one is true?

a) $9 + 5 = 9 - 5$

b) $9 + 5 = 9 + 5 - 5$

c) $9 + 5 = 5 + 9$

Moving through the assessment

Incorrect: Turn the page.

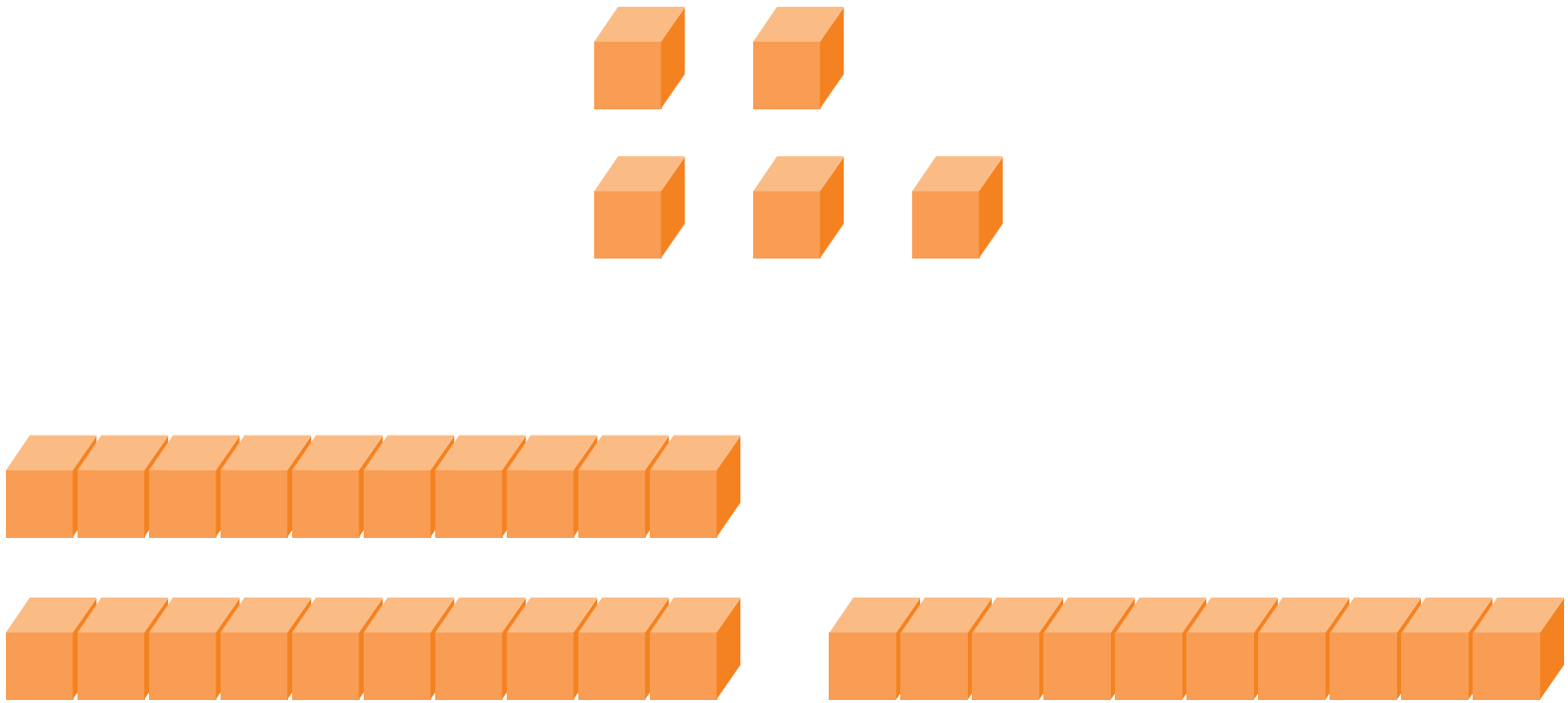
Materials available

Correct response

c) $9 + 5 = 5 + 9$

Student's page

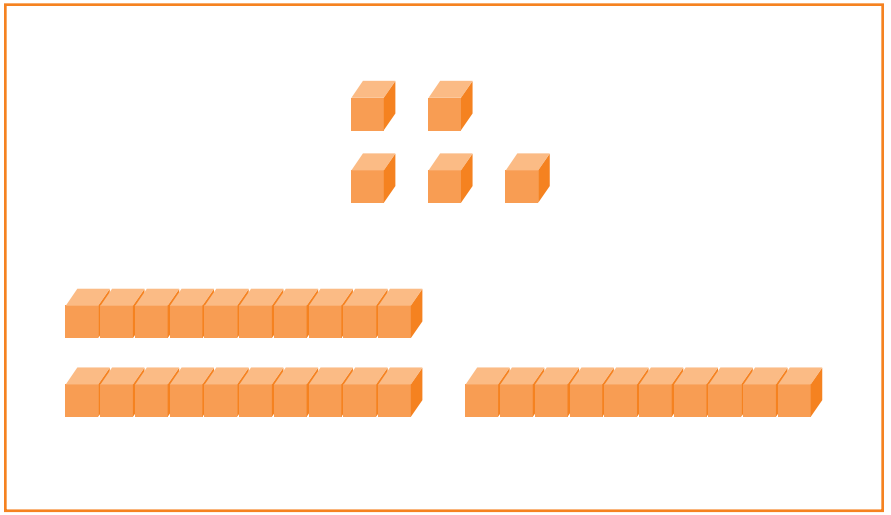
What's the Number?



Teacher's page

What's the Number?

- Place base-ten blocks, linking cubes (sticks of tens and loose cubes) within easy reach.
- Say, **"This picture shows a collection of base-ten blocks. What number is shown by the blocks in this picture?"**



Moving through the assessment

Incorrect: Turn the page.

Materials available

Correct response

Uses tens and ones to get 35

Student's page

Write the Number

8 ones and 4 tens

Teacher's page

Write the Number

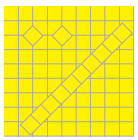
- Say, **"Write the number that is made of 8 ones and 4 tens."**

8 ones and 4 tens

Moving through the assessment

Incorrect: Turn the page.

Materials available



Correct response

Writes "48"

Student's page

Stacking Pennies

We have 78 pennies. We are putting them in stacks of 10 pennies each.

How many full stacks can we make?

How many pennies will be left over?

Teacher's page

Stacking Pennies

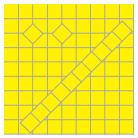
- Read the problem aloud.

We have 78 pennies. We are putting them in stacks of 10 pennies each.
How many full stacks can we make?
How many pennies will be left over?

Moving through the assessment

End of Section 3.

Materials available



Correct response

7 full stacks with 8 pennies left

End of Section 3

101 SW Main St, Suite 500, Portland, OR 97204-3213
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