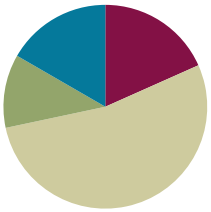
# Lesson 6

## Objective: Measure and compare lengths using centimeters and meters.

### Suggested Lesson Structure



| | |
|---|---|
| Fluency Practice | (11 minutes) |
| Application Problem | (7 minutes) |
| Concept Development | (32 minutes) |
| Student Debrief | (10 minutes) |
| **Total Time** | **(60 minutes)** |

## Fluency Practice (11 minutes)

- Happy Counting **2.NBT.2** (2 minutes)
- Sprint: Find the Longer Length **2.NBT.4** (9 minutes)

### Happy Counting (2 minutes)

Materials: (T) 2 meter sticks

Note: Students fluently count by tens crossing the hundred and relate it to metric units.

T: Let's do some Happy Counting in centimeters. Watch me as I pinch the meter stick where the centimeters are while we count. When I get to 100 centimeters (1 meter), I will call a volunteer to hold another meter stick.

T: Let's count by tens, starting at 70 centimeters. When we get to 100 centimeters, we say 1 meter, and then we will go back to counting by centimeters. Ready? (Pinch the meter stick to stop on a number, moving pinched fingers up and down to lead students in Happy Counting by tens on the meter stick.)

S: 70 cm, 80 cm, 90 cm, 1 m, 110 cm, 120 cm. (Switch direction.) 110 cm, 1 m, 90 cm, 80 cm. (Switch direction.) 90 cm, 1 m, 110 cm, 120 cm.

T: Now, let's say it with meters and centimeters. Let's start at 80 centimeters. Ready?

S: 80 cm, 90 cm, 1 m, 1 m 10 cm, 1 m 20 cm, 1 m 30 cm, 1 m 40 cm. (Switch direction.) 1 m 30 cm, 1 m 20 cm. (Switch direction.) 1 m 30 cm, 1 m 40 cm, 1 m 50 cm, 1 m 60 cm, 1 m 70 cm, 1 m 80 cm, 1 m 90 cm, 2 m.

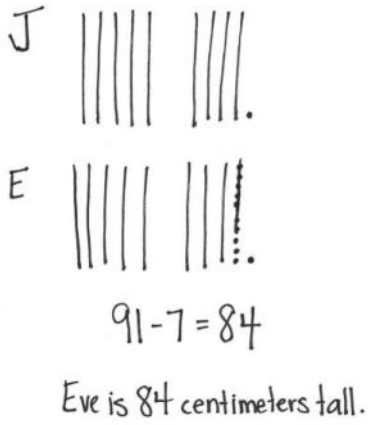
### Sprint: Find the Longer Length (9 minutes)

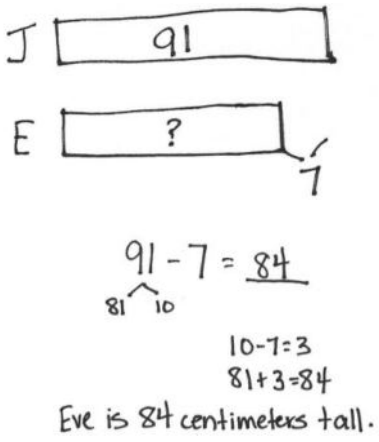
Materials: (S) Find the Longer Length Sprint

Note: Students prepare for comparing lengths in the lesson by identifying the longer length in a Sprint.

## Application Problem (7 minutes)

Eve is 7 centimeters shorter than Joey. Joey is 91 centimeters tall. How tall is Eve?




In today's lesson, students measure and compare lengths in centimeters and meters. This *compare with smaller unknown* problem is similar to the problem in Lesson 5, but here measurement units are used with *shorter than* rather than *less than* or *fewer than*.

## Concept Development (32 minutes)

Materials: (S) Personal white board, centimeter ruler, meter strip (Template); 2 sheets of paper per pair

Note: Meter strips can be made either in advance of the lesson or by students during the lesson.

T: I want to know: How long is the paper? With your pencil, label this side *A*. (Point to the longer side.)

S: (Write an A along the length of the paper.)

T: Use your **meter strip** to measure Side A, and then write the measurement.

S: (Measure and record.)

MP.2

T: Label this side *B*. (Point.)

S: (Write a B along the width of the paper.)

T: How wide is the paper? Measure Side B and record the measurement.

S: (Measure and record.)

T: Which side is longer, Side A or Side B?

S: Side A.

**NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:**

Couple comparative vocabulary with illustrative gestures and questions such as the following:

- Who is taller? Shorter? (Ask with students standing back to back.)
- How wide is this shoe? How long? Which shoe is longer? Which shoe is shorter?
- Point to visuals while speaking to highlight the corresponding vocabulary.

T: How can I find out how much longer? Figure out a way with your partner.
S: Put two of them next to each other to see. → You could measure. → Measure and subtract.
T: Go to your seat with your partner and find out: How much longer is Side A than Side B?

Students go to their seats with two pieces of paper and solve the problem. Allow two to three minutes for students to complete the task. Observe student strategies to choose who will share. Select two or three students who use different approaches to share with the class.

MP.2

T: Who would like to share the strategy they used?
S: I lined up the two pieces of paper and measured the one that was sticking out. → I measured both sides and counted on.
T: What strategy could you use if you only had one piece of paper?
S: Measure and add on! → Measure and subtract!
T: (Model measuring the difference in length using both strategies.)

Repeat the process above using the meter strips to measure and compare the lengths of other objects around the room (e.g., desks and classroom board, the width of the door and the height of the door, the length of a bookcase and the height of a bookcase, student desk and teacher desk). Allow students to record their measurements and work on their personal white board or in their math journal. Then, have students complete the Problem Set.

### Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.

## Student Debrief (10 minutes)

**Lesson Objective**: Measure and compare lengths using centimeters and meters.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

**NOTES ON MULTIPLE MEANS OF ENGAGEMENT:**

The language of comparison may be particularly challenging for English language learners. Scaffold understanding of Problem 5 in the Problem Set using these techniques:

- Break down the problem into small, workable chunks (e.g., "If Alice's ribbon is 1 meter long, how many centimeters long is her ribbon?")
- Reframe the comparing sentence (e.g., "How much *more* ribbon does Alice have than Carol?")
- Teach students to ask themselves questions. "What type of problem is this? What do I know? What is unknown?"

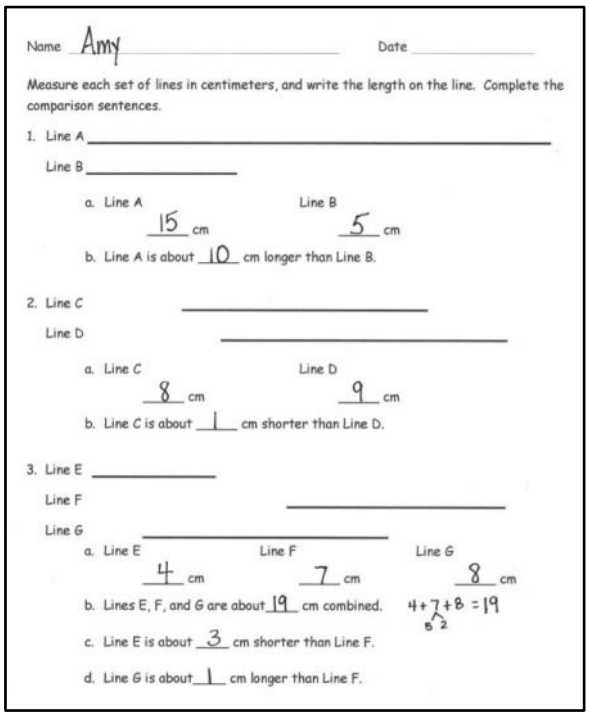
These scaffolds also support Problem 6 on the Problem Set.

Any combination of the questions below may be used to lead the discussion.

- For Problems 1–3, discuss with your partner how you determined the difference in length of the lines you measured. What is interesting about Line F in Problem 3?
- How did finding the missing addend in Problem 4 help you to answer Problem 5?
- Explain to your partner how you solved Problem 6 or Problem 7. How did you show your thinking?
- When you were measuring the paper today, how did your strategy change the second time you solved the problem? Which strategy was more efficient and accurate?
- How would you convince me that there is a benefit to measuring with centimeters versus meters? How about a ruler versus a **meter strip**?

## Exit Ticket (3 minutes)

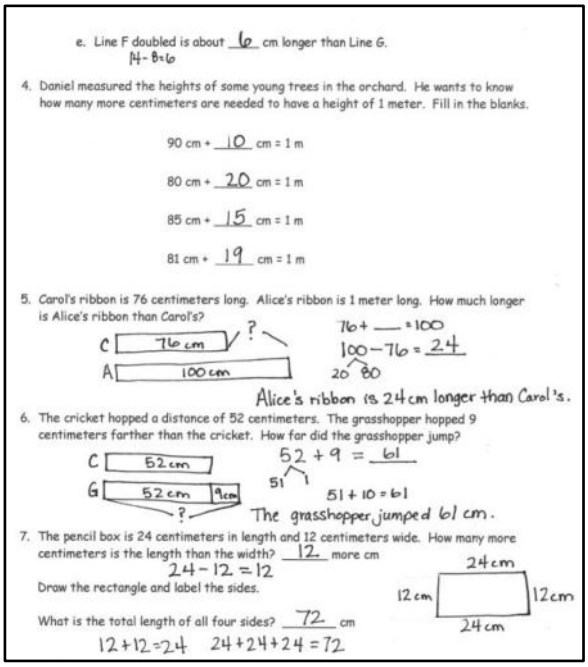
After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.



Name Amy Date

Measure each set of lines in centimeters, and write the length on the line. Complete the comparison sentences.

1. Line A _____
   Line B _____
   a. Line A 15 cm Line B 5 cm
   b. Line A is about 10 cm longer than Line B.
2. Line C _____
   Line D _____
   a. Line C 8 cm Line D 9 cm
   b. Line C is about 1 cm shorter than Line D.
3. Line E _____
   Line F _____
   Line G _____
   a. Line E 4 cm Line F 7 cm Line G 8 cm
   b. Lines E, F, and G are about 19 cm combined. 4+7+8=19
   c. Line E is about 3 cm shorter than Line F.
   d. Line G is about 1 cm longer than Line F.



e. Line F doubled is about 6 cm longer than Line G. 14-8=6

4. Daniel measured the heights of some young trees in the orchard. He wants to know how many more centimeters are needed to have a height of 1 meter. Fill in the blanks.
   90 cm + 10 cm = 1 m
   80 cm + 20 cm = 1 m
   85 cm + 15 cm = 1 m
   81 cm + 19 cm = 1 m
5. Carol's ribbon is 76 centimeters long. Alice's ribbon is 1 meter long. How much longer is Alice's ribbon than Carol's?
   C 76 cm ? A 100 cm
   76+__=100 100-76=24 20 80
   Alice's ribbon is 24 cm longer than Carol's.
6. The cricket hopped a distance of 52 centimeters. The grasshopper hopped 9 centimeters farther than the cricket. How far did the grasshopper jump?
   C 52 cm G 52 cm 9 cm ?
   52+9=61 51 1 51+10=61
   The grasshopper jumped 61 cm.
7. The pencil box is 24 centimeters in length and 12 centimeters wide. How many more centimeters is the length than the width? 12 more cm
   24-12=12
   Draw the rectangle and label the sides.
   What is the total length of all four sides? 72 cm
   12+12=24 24+24+24=72

A

Number Correct: _____

Improvement: _____

Circle the longer length.

| | | |
|---|---|---|
| 1. | 1 cm | 0 cm |
| 2. | 11 cm | 10 cm |
| 3. | 11 cm | 12 cm |
| 4. | 22 cm | 12 cm |
| 5. | 29 cm | 30 cm |
| 6. | 31 cm | 13 cm |
| 7. | 43 cm | 33 cm |
| 8. | 33 cm | 23 cm |
| 9. | 35 cm | 53 cm |
| 10. | 50 cm | 35 cm |
| 11. | 55 cm | 45 cm |
| 12. | 50 cm | 55 cm |
| 13. | 65 cm | 56 cm |
| 14. | 66 cm | 56 cm |
| 15. | 66 cm | 86 cm |
| 16. | 86 cm | 68 m |
| 17. | 68 cm | 88 cm |
| 18. | 89 cm | 98 cm |
| 19. | 99 cm | 98 m |
| 20. | 99 cm | 1 m |
| 21. | 1 m | 101 cm |
| 22. | 1 m | 90 cm |
| 23. | 110 cm | 101 cm |
| 24. | 110 cm | 1 m |
| 25. | 1 m | 111 cm |
| 26. | 101 cm | 1 m |
| 27. | 111 cm | 101 cm |
| 28. | 112 cm | 102 cm |
| 29. | 110 cm | 115 cm |
| 30. | 115 cm | 105 cm |
| 31. | 106 cm | 116 cm |
| 32. | 108 cm | 98 cm |
| 33. | 119 cm | 99 cm |
| 34. | 131 cm | 133 cm |
| 35. | 133 cm | 113 cm |
| 36. | 142 cm | 124 cm |
| 37. | 144 cm | 114 cm |
| 38. | 154 cm | 145 cm |
| 39. | 155 cm | 152 cm |
| 40. | 198 cm | 199 cm |
| 41. | 215 cm | 225 cm |
| 42. | 252 cm | 255 cm |
| 43. | 2 m | 295 cm |
| 44. | 3 m | 295 cm |

B

Circle the longer length.

| | | |
|---|---|---|
| 1. | 0 cm | 1 cm |
| 2. | 10 cm | 12 cm |
| 3. | 12 cm | 11 cm |
| 4. | 32 cm | 13 cm |
| 5. | 39 cm | 40 cm |
| 6. | 41 cm | 14 cm |
| 7. | 44 cm | 40 cm |
| 8. | 44 cm | 54 cm |
| 9. | 55 cm | 65 cm |
| 10. | 60 cm | 59 cm |
| 11. | 65 cm | 45 cm |
| 12. | 70 cm | 65 cm |
| 13. | 75 cm | 57 cm |
| 14. | 77 cm | 76 cm |
| 15. | 87 cm | 78 cm |
| 16. | 79 cm | 97 m |
| 17. | 79 cm | 88 cm |
| 18. | 98 cm | 97 cm |
| 19. | 99 cm | 1 m |
| 20. | 99 cm | 100 cm |
| 21. | 101 cm | 100 cm |
| 22. | 1 m | 101 cm |

| | | |
|---|---|---|
| 23. | 111 cm | 101 cm |
| 24. | 101 cm | 110 cm |
| 25. | 1 m | 110 cm |
| 26. | 111 cm | 1 m |
| 27. | 113 cm | 117 cm |
| 28. | 112 cm | 111 cm |
| 29. | 115 cm | 105 cm |
| 30. | 106 cm | 116 cm |
| 31. | 107 cm | 117 cm |
| 32. | 118 cm | 108 cm |
| 33. | 119 cm | 120 cm |
| 34. | 132 cm | 123 cm |
| 35. | 133 cm | 132 cm |
| 36. | 143 cm | 134 cm |
| 37. | 144 cm | 114 cm |
| 38. | 154 cm | 145 cm |
| 39. | 155 cm | 152 cm |
| 40. | 195 cm | 199 cm |
| 41. | 225 cm | 152 cm |
| 42. | 252 cm | 255 cm |
| 43. | 2 m | 295 cm |
| 44. | 3 m | 295 cm |

Name _____ Date _____

Measure each set of lines in centimeters, and write the length on the line. Complete the comparison sentences.

1. Line A _____

   Line B _____

   a. Line A _____ cm  Line B _____ cm

   b. Line A is about _____ cm longer than Line B.

2. Line C _____

   Line D _____

   a. Line C _____ cm  Line D _____ cm

   b. Line C is about _____ cm shorter than Line D.

3. Line E _____

   Line F _____

   Line G _____

   a. Line E _____ cm  Line F _____ cm  Line G _____ cm

   b. Lines E, F, and G are about_____ cm combined.

   c. Line E is about _____ cm shorter than Line F.

   d. Line G is about_____ cm longer than Line F.

   e. Line F doubled is about _____ cm longer than Line G.

4. Daniel measured the heights of some young trees in the orchard. He wants to know how many more centimeters are needed to have a height of 1 meter. Fill in the blanks.

   a. 90 cm + _____ cm = 1 m

   b. 80 cm + _____ cm = 1 m

   c. 85 cm + _____ cm = 1 m

   d. 81 cm + _____ cm = 1 m

5. Carol's ribbon is 76 centimeters long. Alice's ribbon is 1 meter long. How much longer is Alice's ribbon than Carol's?

6. The cricket hopped a distance of 52 centimeters. The grasshopper hopped 9 centimeters farther than the cricket. How far did the grasshopper jump?

7. The pencil box is 24 centimeters in length and 12 centimeters wide. How many more centimeters is the length than the width? _____ more cm

   Draw the rectangle and label the sides.

   What is the total length of all four sides? _____ cm

Name _____ Date _____

Measure the length of each line and compare.

Line M 

Line N 

Line O 

1. Line M is about _____ cm longer than Line O.

2. Line N is about _____ cm shorter than Line M.

3. Line N doubled would be about _____ cm (longer/shorter) than Line M.

Name _____ Date _____

Measure each set of lines in centimeters, and write the length on the line. Complete the comparison sentences.

1. Line A _____

   Line B _____

   a. Line A is about _____ cm longer than line B.

   b. Line A and B are about _____ cm combined.

2. Line X _____

   Line Y _____

   Line Z _____

   a. Line X Line Y Line Z

   _____ cm _____ cm _____ cm

   b. Lines X, Y, and Z are about_____ cm combined.

   c. Line Z is about _____ cm shorter than Line X.

   d. Line X is about _____ cm shorter than Line Y.

   e. Line Y is about _____ cm longer than Line Z.

   f. Line X doubled is about _____ cm longer than line Y.

3. Line J is 60 cm long. Line K is 85 cm long. Line L is 1 m long.

   a. Line J is _____ cm shorter than line K.

   b. Line L is _____ cm longer than line K.

   c. Line J doubled is _____ cm more than line L.

   d. Lines J, K, and L combined are _____ cm.

4. Katie measured the seat height of four different chairs in her house. Here are her results:

   Loveseat height: 51 cm
   Dining room chair height: 55 cm
   Highchair height: 97 cm
   Counter stool height: 65 cm

   a. How much shorter is the dining room chair than the counter stool? _____ cm

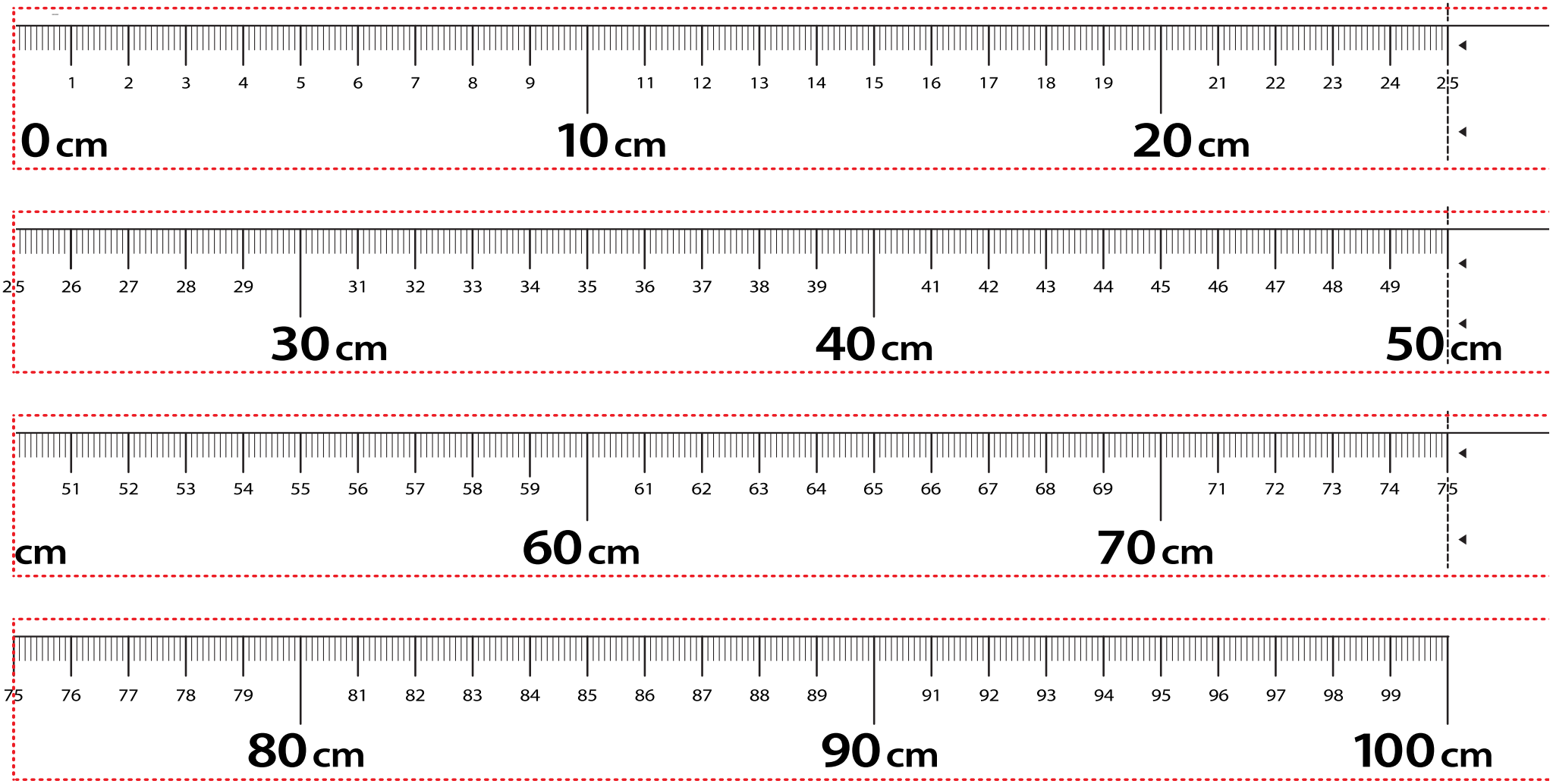
   b. How much taller is a meter stick than the counter stool? _____ cm

   c. How much taller is a meter stick than the loveseat? _____ cm

5. Max ran 15 meters this morning. This afternoon, he ran 48 meters.

   a. How many more meters did he run in the afternoon?

   b. How many meters did Max run in all?




meter strip

**LEGEND** ------ CUT ———— ALIGN EDGE