

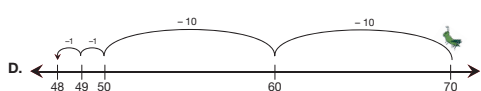
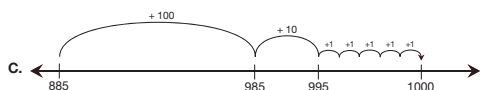
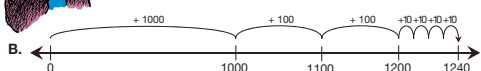
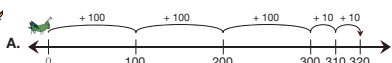
Big Base-Ten Hoppers

Mathhoppers are very special creatures that live on number lines. Professor Peabody studies how they behave. He found several kinds, including the base-ten hopper. He makes drawings of the way base-ten hoppers move.

Discuss



- Study the base-ten hoppers' moves on the four number lines below.
 - What distances can the base-ten hopper move in one hop?
 - In what directions can the base-ten hopper move?



Student Guide

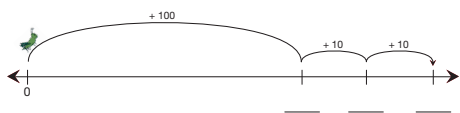
Big Base-Ten Hoppers

Questions 1–19 (SG pp. 116–122)

- * Hopper can move by 1000s, 100s, 10s, or 1s. Hopper can move right (+) or left (-).
- A.* Path of hopper dips down to tick mark on number line. Under each mark he writes the number for where the hopper is on the number line; + or - and a number
 - B.* Distance and direction of the hop.
- A. 0
B. 120
C. 100, 110, 120
- A. 0
B. 1200
C. +100, +100
- A. 160
B. 501
C. $10 + 10 + 10 + 10 + 100 + 100 + 100 + 1 = 341$ hops; Sum of hops

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- Study the way Professor Peabody represents the hoppers' moves.
 - How does he show where the hopper lands after each hop?
 - What does he write above the hops? What does that tell you?
- Professor Peabody saw a base-ten hopper make the moves shown below. He did not finish his drawing.

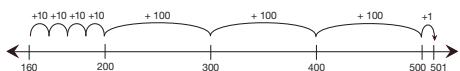


- Where did the hopper start?
 - Where did the hopper land when it finished hopping?
 - What should Professor Peabody write under the number line?
- Professor Peabody started to record the moves of a larger base-ten hopper on the number line below.



- Where did the hopper start?
- Where did the hopper land when it finished hopping?
- What should Professor Peabody write for the question marks?

- Observe the base-ten hopper's moves below.



- Where did the hopper start?
- Where did the hopper land when it finished hopping?
- How far is it from where the hopper started to where it landed? How do you know?

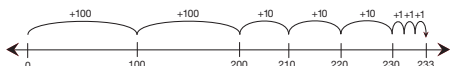
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*Answers and/or discussion are included in the lesson.

Discuss

Number Sentences

9. Professor Peabody looked for shorter ways to represent the moves of the base-ten hoppers. Study the number line below.



A. The professor wrote the number sentence below to show how the hopper moved:

$$233 = 100 + 100 + 10 + 10 + 10 + 1 + 1 + 1$$

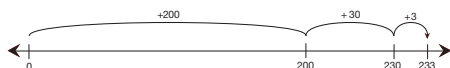
Explain how each number in the number sentence shows how the hopper moved.

B. The professor thought of a shorter way to write a number sentence:

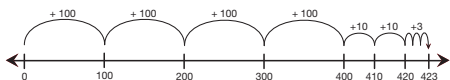
$$233 = 200 + 30 + 3$$

Explain how this number sentence shows how the hopper moved.

Professor Peabody decided it would be more efficient sometimes to show the hops using multiples of hundreds, tens, and ones like this:



10. Study the number line and number sentences below. Do you agree that the number sentences show how the hopper moved? Why or why not?



A. $4 \times 100 + 2 \times 10 + 3 \times 1 = 423$

B. $400 + 20 + 3 = 423$

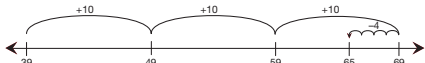
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Study the number lines and number sentences in Questions 11 and 12 below.

- Do you agree that the number sentences are correct? If not, correct them.
- How do the sentences match the moves on the number line?

11. A.



$$39 + 30 - 4 = 65$$

B.



$$39 + 20 + 1 + 5 = 65$$

C. How far is it from 39 to 65?

D. Complete the number sentence: $39 + \square = 65$

12. A.



$$648 + 2 + 50 + 300 = 1000$$

B.



$$648 + 300 + 50 + 2 = 1000$$

C. How far is it from 648 to 1000?

D. Complete the number sentences:

$$648 + \square = 1000 \quad 1000 - 648 = \square$$

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*Answers and/or discussion are included in the lesson.

9. A. Answers will vary. Each number moves the hopper by that much to the right, since all the numbers are added.

B. The hopper jumps all the 100s at once, all the 10s at once, and all the 1s at once.

10. A–B. A student may respond, the hopper started at zero and jumped four +100s, two +10s and three +1s for a total of 423. Both sentences do show how the hopper moved.

11. A.* Number sentence is correct.

Descriptions will vary. A student may respond that the first number, 39, is the starting point, followed by three +10s for the 30, then 4 back for subtracting 4.

B.* Number sentence is correct. Descriptions will vary. A student may respond that the first number, 39, is the starting point, followed by one +20 for 59, then a +1 hop to 60 and 5 more +1s to get 65.

C.* 26

D.* 26

12. A.* Number sentence is correct. Descriptions will vary. A student may respond that 648 is the starting point, followed by at 2 hop to 650, a +50 hop to get to 700, followed by a +300 hop to land on 1000.

B.* Number sentence is correct.

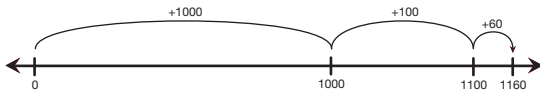
Descriptions will vary. A student may respond that the first number is the starting point, followed by +300 to get to 948, followed by +50 to get to 998, followed by +2 to get to 1000.

C.* 352

D.* 352, 352

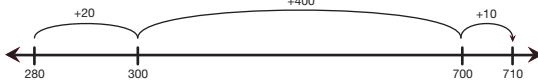
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13. A. Possible response:



B. $1160 = 1000 + 100 + 60$

14. A. Possible response:



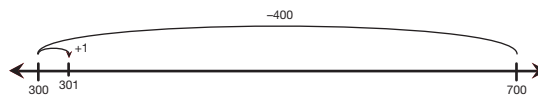
B. Stops at 710

15. A. Possible response:



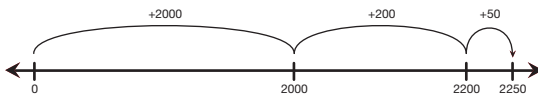
B. $681 = 1000 - 300 - 20 + 1$

16. A.



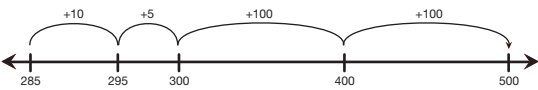
B. Stops at 301

17. A. Possible response:



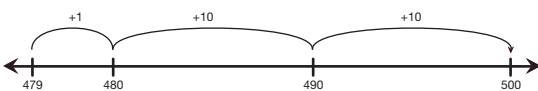
B. $2250 = 2000 + 200 + 50$

18. A. Possible response:



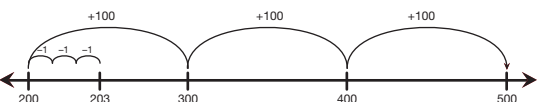
$285 + 10 + 5 + 100 + 100 = 500$
 $500 - 215 = 285$

B. Possible response:



$479 + 1 + 10 + 10 = 500$
 $500 - 21 = 479$

C. Possible response:



$203 - 3 + 300 = 500$
 $500 - 297 = 203$



✓ Check-In: Questions 13-19

For Questions 13-19, draw number lines to show how the base-ten hoppers move.

- Show the distance and direction of each move above the hop.
- Show where the hopper lands below the number line after each move.

13. A. The base-ten hopper starts at 0 and moves forward 1160.

B. Write a number sentence that shows how the hopper moved.

14. A. Show two ways that a base-ten hopper can start at 280 and move forward 430.

B. Where does the hopper stop?

15. A. The base-ten hopper starts at 1000 and moves back 319.

B. Write a number sentence that shows how the hopper moved and where it stopped.

16. A. Show how a base-ten hopper can start at 700 and move back 399 in as few moves as possible.

B. Where does the hopper stop?

17. A. Show how a base-ten hopper can start at 0 and move to 2250.

B. Write a number sentence to show how it moved.

18. For the starting numbers below, show how a base-ten hopper can move to get to 500. Write an addition number sentence for each. Then write a subtraction number sentence in the same family.

- A. 285 B. 479 C. 203

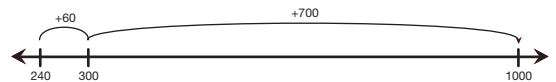
19. For the starting numbers below, show how a base-ten hopper can move to get to 1000. Write an addition number sentence to show the moves. Then write a subtraction sentence in the same family.

- A. 240 B. 465 C. 742

Practice using base-ten hoppers on the *Helping Professor Peabody* pages of your *Student Activity Book*.

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19. A. Possible response:



$240 + 60 + 700 = 1000$
 $1000 - 760 = 240$

B. Possible response:



$465 + 5 + 30 + 500 = 1000$
 $1000 - 535 = 465$

C. Possible response:



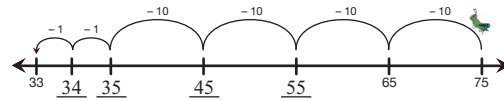
$742 + 200 + 50 + 8 = 1000$
 $1000 - 258 = 742$

Student Activity Book

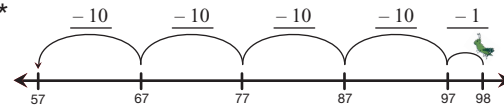
Exploring Base-Ten Hoppers

Questions 1–9 (SAB pp. 95–97)

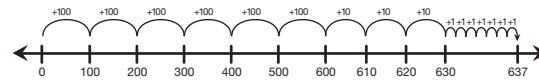
- 1. A. 75
- B. 33
- C.



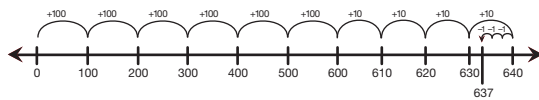
- 2. A. * 98
- B. * 57
- C. *



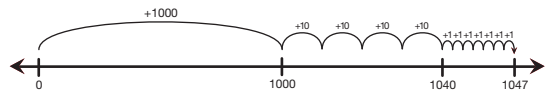
- 3. One possible way:



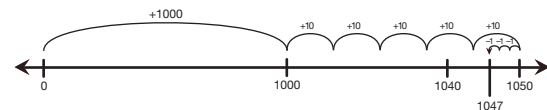
Another possible way:



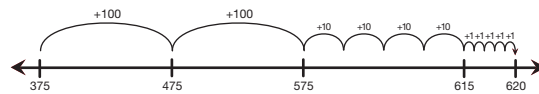
- 4. One possible way:



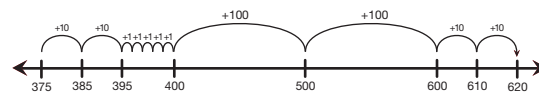
Another possible way:



- 5. A. Lands on 620



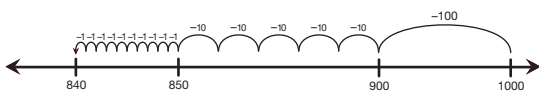
B. Another possible way:



- 6. A. Lands on 840. One possible way:



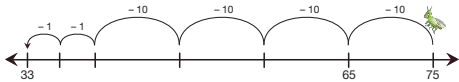
B. 840



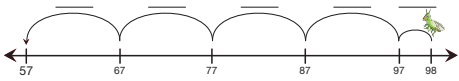
Name _____ Date _____

Exploring Base-Ten Hoppers

- 1. A base-ten hopper made the moves shown below.



- A. Where did the hopper start? _____
- B. Where did the hopper land when it finished hopping? _____
- C. Write in the correct numbers under the number line.



- 2. Another base-ten hopper made the moves shown below.
- A. Where did the hopper start? _____
- B. Where did the hopper land when it finished hopping? _____
- C. Write in the correct numbers over each hop.

- 3. Work with a partner. Use these number lines to show how a base-ten hopper can start at 0 and land on 637. Find more than one way. Remember to show where it started and finished. Write in the correct numbers under the number line and over each hop.



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Name _____ Date _____

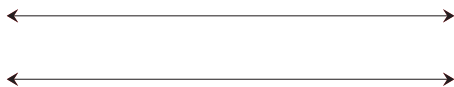
- 4. Work with a partner. Use these number lines to show how a base-ten hopper can start at 0 and move forward 1047. Find more than one way.



- 5. Work with a partner. Use these number lines.
- A. Show how a base-ten hopper can start at 375 and move forward 245. Where does it land?
- B. Show more than one way.



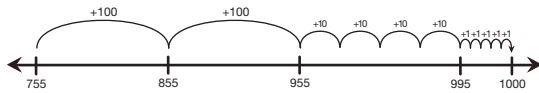
- 6. Work with a partner. Use these number lines.
- A. Show how a base-ten hopper can start at 1000 and move back 160. Where does it land?
- B. Show more than one way.



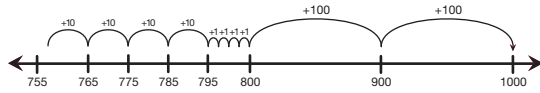
Student Activity Book - Page 96

*Answers and/or discussion are included in the lesson.

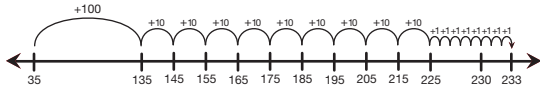
7. A. 245. One possible way:



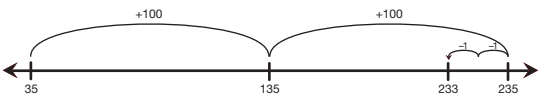
B. Another possible way:



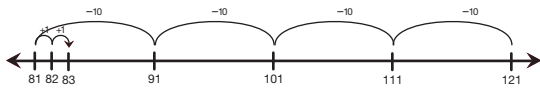
8. A. Lands on 233. One possible way:



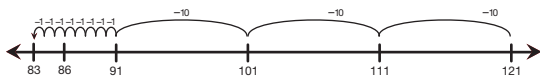
B. Another possible way:



9. A. Lands on 83.



B. Another possible way:



Name _____ Date _____

7. Work with a partner and use these number lines.
- A. Show how a base-ten hopper can start at 755 and move to 1000. How far did it move?
 - B. Show another way that uses a different number of hops.



8. Work with a partner and use these number lines.
- A. Show how a base-ten hopper can start at 35 and move forward 198. Where did the base-ten hopper land?
 - B. Show another way that uses a different number of hops.



9. Work with a partner and use these number lines.
- A. Show how a base-ten hopper can start at 121 and move back 38. Try to use only 6 hops or less. Where did the base-ten hopper land?
 - B. Show another way that uses a different number of hops.



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The Number Sentences section of the *Big Base-Ten Hoppers* pages in the *Student Guide* will provide more practice with base-ten hoppers and number lines.

Student Activity Book

Name _____ Date _____

Helping Professor Peabody

Help Professor Peabody complete the number lines. Be sure that the distance and direction of each hop is clear. Then, answer the questions.

1.



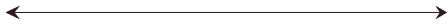
- A. Show the distance and direction above each hop.
- B. Draw a number line below that shows how a base-ten hopper can move from 0 to 398 another way.



2.



- A. Show the distance and direction above each hop.
- B. Show how a hopper can move from 432 to 831 another way.



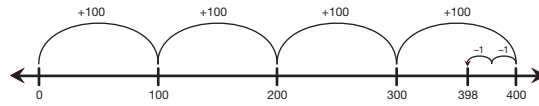
- C. How far is it from 432 to 831? _____
- D. Complete the number sentence: $432 + \square = 831$

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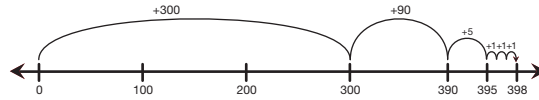
Helping Professor Peabody

Questions 1–6 (SAB pp. 99–101)

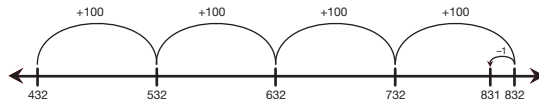
1. A.



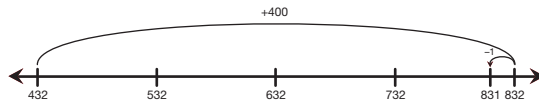
B. Responses will vary. A possible response:



2. A.*



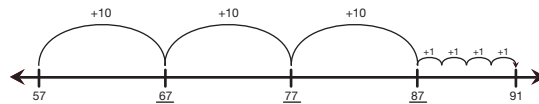
B.* Responses will vary. A possible response:



C.* 399

D.* $432 + \boxed{399} = 831$

3. A.

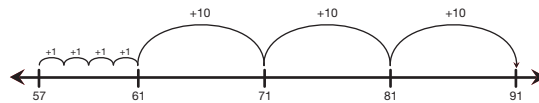


B. 34

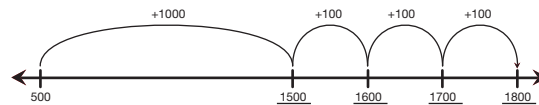
C. $57 + \boxed{34} = 91$

D. $91 - 34 = 57$

E. Possible response



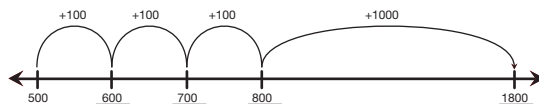
4. A.



B. 1300

C. $500 + 1000 + 300 = 1800$

D. Responses will vary. A possible response:



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Name _____ Date _____

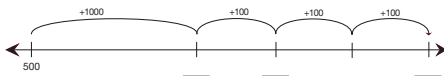
3.



- A. Fill in the blanks to show where the base-ten hopper lands. _____
- B. How far did the base-ten hopper move? _____
- C. Complete the number sentence $57 + \square = 91$.
- D. Write a subtraction number sentence in the same family.
- E. Show another way for the base-ten hopper to move from 57 to 91.



4.



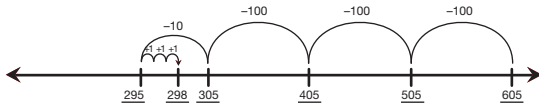
- A. Fill in the blanks to show where the hopper lands. _____
- B. How far is it from 500 to the point where the hopper stopped? _____
- C. Write a number sentence to match the hopper's moves. _____
- D. Show another way to start at 500 and move to the point where the hopper stopped.

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*Answers and/or discussion are included in the lesson.

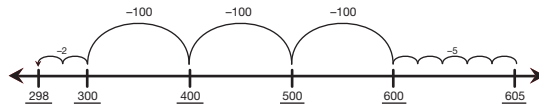
5. A.



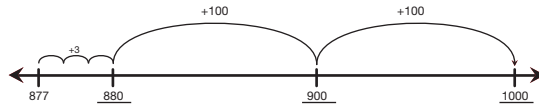
B. 307

C. $605 - 300 - 7 = 298$

D. Answers may vary.

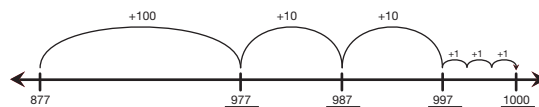


6. A.



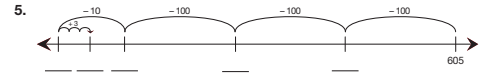
B. 123

C. Answers may vary.



D. Answers may vary. $877 + 123 = 1000$

Name _____ Date _____



- A. Fill in the blanks to show where the hopper lands.
 B. How far is it from 605 to the point where the hopper stops?

C. Write a number sentence that shows how the hopper moved.

- D. Show another way for a base-ten hopper to start at 605 and stop at the same point.



- A. Fill in the blanks to show where the hopper lands.
 B. How far is it from 877 to the point where the hopper stopped?

C. Show another way for a base-ten hopper to start at 877 and land at the same point.



D. Write a number sentence that shows how your hopper moved.

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