## Unit 3 Lesson 10: A New Kind of Number

### 1 Numbers Are Inventions (Warm up)

#### Student Task Statement

Jada was helping her cousin with his math homework. He was supposed to solve the equation $8+x=5$. He said, “If I subtract 8 from both sides, I get $x=5−8$. This doesn’t make sense. You can’t subtract a bigger number from a smaller number. If I have 5 grapes, I can’t eat 8 of them!”

What do you think Jada could say to her cousin to help him understand why $5−8$ actually does make sense?

#### Activity Synthesis





### 2 The Square Root of Negative One

#### Student Task Statement

Numbers on the number line are often called **real numbers**.



1. The equation $x^{2}=9$ has 2 real solutions. How can you see this on the graph of $y=x^{2}$? Draw points on this real number line to represent these 2 solutions.
2. How many real solutions does $x^{2}=0$ have? Explain how you can see this on the graph of $y=x^{2}$. Draw the solution(s) on a real number line.
3. How many real solutions does $x^{2}=-1$ have? Explain how you can see this on the graph of $y=x^{2}$. Draw the solution(s) on a real number line.

#### Activity Synthesis



### 3 Imaginary Numbers

#### Images for Launch



#### Student Task Statement

1. On the real number line:
	1. Draw an arrow starting at 0 that represents 3.
	2. Draw an arrow starting at 0 that represents -5.
* 
1. This diagram shows an arrow that represents $\sqrt{-1}$.
* 
	1. Draw an arrow starting at 0 that represents $3\sqrt{-1}$.
	2. Draw an arrow starting at 0 that represents $-\sqrt{-1}$.
	3. Draw an arrow starting at 0 that represents $-5\sqrt{-1}$.



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