Warm Up: What does "Mean" mean?

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CST/CAHSEE:

Review:

x

Current:

Identify the outliers in the following data sets:

A) 16, 13, 11, 13, 17, 2, 11, 12

B) 16, 13, 11, 13, 17, 8, 11, 12

Other:

At Ethan's birthday party, Logan got 6 pieces of candy, Tallulah got 3 pieces of candy, Javier got 2 pieces of candy, and Sanjay got 5 pieces of candy.

What can Ethan do to make sure everyone has the same number of pieces of candy?

CA Content Standards:

Grade 5 SDAP 1.1, Grade 6 SDAP 1.1, Grade 6 SDAP 1.2, Grade 6 SDAP 1.3

Objective:

Students will be able to understand the concept of mean and compute the mean within a given set of data using multiple approaches.

Vocabulary: **do not give vocabulary to students until after they've generated a working description of mean**

mean/average: a value that represents the measure of center for a set of data when the data is evened out.
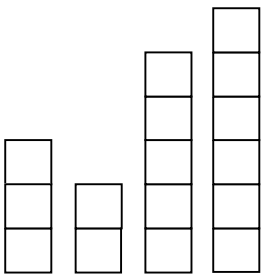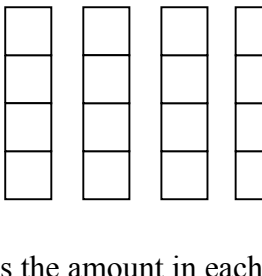
averaging: evening out the values in each group so they have the same amount.

*students will generate this description during the course of the lesson

outlier: a piece of data that is not representative of most of the other pieces of data

*discuss concept of measures of central tendency as they pertain to the lesson.

Example 1 (We Do): Find the mean of the data set $\{3, 2, 5, 6\}$

Concrete/Build It	Semi-Concrete/Draw It
- Students will build the data set using concrete manipulatives. _(bar diagram)_ - Instruct students to "even out" the groups so that groups have the same amount. There will be 4 groups because there are 4 pieces of data. _(bar diagram)_ - Average is the amount in each group. ∴ average is 4. - Students will then work together to generate their own working description of mean. - Students should then duplicate the activity while writing step-by-step notes.	Students will "even out groups using addition and subtraction. $\{3, 2, 5, 6\}$ $$\begin{array}{cccc} 3 & 2 & 5 & 6 \\ \downarrow +1 & & \downarrow -1 & \\ \hline 3 & 3 & 5 & 5 \\ \hline +1 & +1 & -1 & -1 \\ \hline 4 & 4 & 4 & 4 \end{array}$$ _-1+1 is a zero pair! Discuss the Identity Property (adding 0 to a number doesn't change the number.)_ *you must add the same amount you subtract, or you change the data set. ∴ average is 4. Note: the number of pieces of data in the set represents the number of groups.

You Try 1:

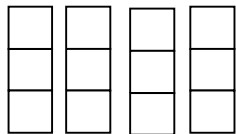| Concrete/Build It	Semi-Concrete/Draw It
Find the mean of the data set $\{2, 5, 4, 1\}$	Find the mean of the data set $\{26, 30, 31, 33\}$

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Concrete/Build It

Find the mean of the data set $\{2, 5, 4, 1\}$
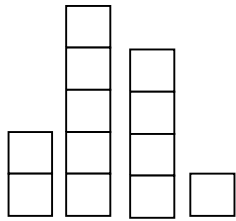
- Make 4 even groups because there are 4 pieces of data. $\{2, 5, 4, 1\}$

∴ average is 3.

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Semi-Concrete/Draw It

Find the mean of the data set $\{26, 30, 31, 33\}$

26	30	31	33	$-2+2$
$+2$	▼	▼	-2	

28	30	31	31
$+2$	↓	-1	-1

30	30	30	30

∴ average is 30.

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Example 2 (We Do):

You Try 2:

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Find the mean of the data set: $\{12, 18, 9, 0, 11\}$

12	18	9	0	11
-3	-3	▼	$+9$	-3

9	15	9	9	8
$+1$	-4	$+1$	$+1$	$+1$

10	11	10	10	9
▼	-1	▼	▼	$+1$

10	10	10	10	10

∴ average is 10.

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Find the mean of the data set: $\{10, 0, 9, 11, 8, 10\}$

10	0	9	11	8	10
-2	$+7$	↓	-3	▼	-2

8	7	9	8	8	8
▼	$+2$	-2	▼	▼	▼

8	8	8	8	8	8

∴ average is 8.

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Example 3 (We Do):

Find the mean of the data set: $\{13, 8, 3, 18, 14\}$

13	8	3	18	14
↓	↓	+7	-7	↓

13	8	10	11	14
↓	+2	↓	↓	-2

13	10	10	11	12
-2	+1	+1	↓	↓

11	11	11	11	12
				-1

11	11	11	11	11
$+\frac{1}{5}$	$+\frac{1}{5}$	$+\frac{1}{5}$	$+\frac{1}{5}$	$+\frac{1}{5}$

$\frac{5}{5}$ → 5 because there are 5 pieces of data
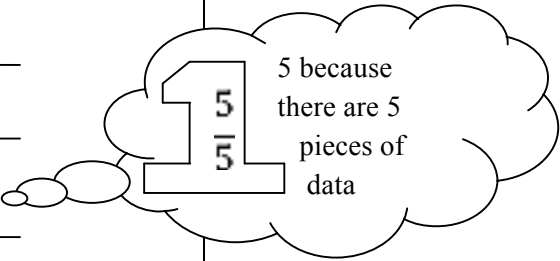
$\therefore$ average is $11\frac{1}{5}$

You Try 3:

Find the mean of the data set: $\{18, 23, 14\}$

18	23	14
↓	-4	+4

18	19	18
↓	-1	↓

$\frac{3}{3}$ → 1

18	18	18
$+\frac{1}{3}$	$+\frac{1}{3}$	$+\frac{1}{3}$

$\therefore$ average is $18\frac{1}{3}$.

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Example 4 (We Do): **Example 5~Challenge (We Do):**
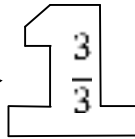
Example 4 (We Do):

Find the mean of the data set: $\{33, 58, 21, 87, 26\}$

33	58	21	87	26
↓	↓	+20	-20	↓

33	58	41	67	26
+10	-10	+15	-15	↓

43	48	56	52	26
↓	↓	-8	-8	+16

43	48	48	44	42
↓	↓	-4	↓	+4

43	48	44	44	46
↓	-2	+1	+1	↓

43	46	45	45	46
+2	-1	↓	↓	-1

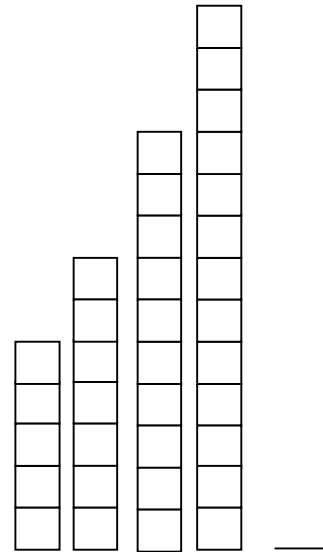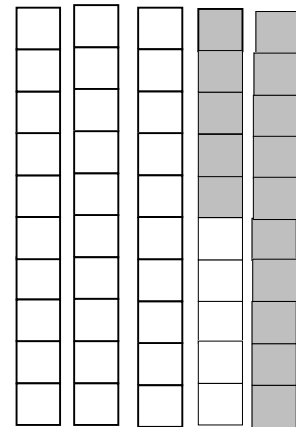| 45	45	45	45	45

∴ average is 45.

Example 5~Challenge (We Do):

Find the missing number in the data set with a mean of 10; $\_\{5, 7, 10, 13\}$

Build It
$\{5, 7, 10, 13\}$

We know the mean is 10, so students should "even out" to make all groups have 10. Then they will be able to figure out the difference.

The shaded boxes are the missing piece of data, ∴ the missing piece of data is 15.

Draw It

$\{5, 7, 10, 13\}$

5	7	10	13	__
10	10	10	10	10

Using 10 because 10 is the mean of the data set. Then find the difference.

Must be +5 to create a zero pair!

-5	-3	↓	+3	+5
5	7	10	13	15

∴ the missing piece of data is 15.

You Try~Challenge 4:

Find the missing number in the data set with a mean of 25; $\{20, 25, 30, \_\_, 32, 18\}$

Draw It

$\{20, 25, 30, \_\_, 32, 18\}$

20	25	30	__	32	18
25	25	25	25	25	25

Using 25 because 25 is the mean of the data set. Then find the difference.

-5	↓	+5	↓	+7	-7
20	25	30	25	32	18

There is no difference, so the 25 drops down, and becomes the missing piece of data.

∴ 25 is the missing piece of data.