Day 1

**WHALES IN THE CITY**

1. September

2a. FIN WHALE CALLS FROM 8/18 TO 8/24

<table>
<thead>
<tr>
<th>Day</th>
<th>Number of Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/18</td>
<td>5</td>
</tr>
<tr>
<td>8/19</td>
<td>10</td>
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<td>8/20</td>
<td>20</td>
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<td>8/21</td>
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<td>8/22</td>
<td>30</td>
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<tr>
<td>8/23</td>
<td>25</td>
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<tr>
<td>8/24</td>
<td>15</td>
</tr>
</tbody>
</table>

2b. August 18, August 22, August 23

3. WHALE CALLS HEARD OVER A PERIOD OF TIME

4a. humpback

4b. Answers will vary, though they might have been communicating with each other or responding to something in the area (such as a predator).

5. Answers will vary, but should include something about how the sound data cannot provide any identifying characteristics about the whales, like sex, age, or health. The sounds can’t help you differentiate between individual whales. The data can tell you the species along with the time and relative location of the calls.

Day 2

**MUDDY MOVES**

1A. C, yardstick

1B. D, feet

2A. Scale

2B. Pounds or tons; It depends on the size of the trucks and how much dirt they can hold.

3A. B, volume

3B. Cups, pints, quarts, or gallons

4A. No, you would need to measure the length to find the distance.

4B. An odometer because it measures longer distances

Day 3

**DOMINO DESIGNER**

5. 20

6. 200

7. 5,300

8. 1,508 → 1,500
   1,332 → 1,300
   1,428 → 1,400
   Greatest to least: 1,500; 1,400; 1,300

9A. 76,020

5B. 76,000. Answers will vary. Possible answers: The answer in 5B (76,000) is less than the answer in 5A (76,020). The number in 5A rounded up, while the number in 5B rounded down.
Day 4

BURGER BUGS?

1A. A and D
1B. Chicken has less fat because $\frac{1}{9} < \frac{1}{8}$.

2A. Grasshoppers

Tilapia

2B. Grasshoppers

3. I would choose caterpillars because $\frac{7}{10} > \frac{1}{10}$.

4. Crickets (\(\frac{1}{3}\)), Palm Weevil Grubs (\(\frac{1}{7}\)), Beef (\(\frac{1}{10}\))

Day 5

EXTRAORDINARY EYES

5. 12 owl eyes

2A. $5 \times 4 = 20$ eyes

2B. Answers will vary. Possible answers: $4 \times 5 = 20$; $5 + 5 + 5 + 5 = 20$; $4 + 4 + 4 + 4 + 4 = 20$

3. Arrays can be arranged in the following configurations.

\[
\begin{array}{c}
\text{X X X X} \\
\text{X X X} \\
\text{X X} \\
\text{X X} \\
\text{X X} \\
\text{X X} \\
\text{X X} \\
\text{X X} \\
\end{array}
\]

4. $2 \times 5 = 10$ eyes

Day 6

BEATS OF ART

1a. $3 \text{ cm} + 3 \text{ cm} + 3 \text{ cm} + 3 \text{ cm} = 12 \text{ cm}$

1b. $3 \text{ cm} \times 3 \text{ cm} = 9 \text{ cm}^2$

2a. $6 \text{ cm} + 6 \text{ cm} + 6 \text{ cm} = 18 \text{ cm}$

2b. $6 \text{ cm} \times 6 \text{ cm} = 36 \text{ cm}^2$

3a. $4 \text{ cm} + 4 \text{ cm} = 8 \text{ cm}; 20 \text{ cm} - 8 \text{ cm} = 12 \text{ cm}; 12 \text{ cm} \div 2 \text{ (sides)} = 6 \text{ cm}$

3b. $4 \text{ cm} \times 6 \text{ cm} = 24 \text{ cm}^2$

4. $8 \text{ cm} - 5 \text{ cm} = 3 \text{ cm}; 3 \text{ cm} \times 5 \text{ cm} = 15 \text{ cm}^2$

5a. Answers will vary.

5b. Answers will vary.

Day 7

SAND SCULPTOR

1. B, rectangle

2. Answers will vary. Possible answers: right triangle, irregular triangle, polygon with 3 sides, a triangle with 1 right angle and 2 acute angles, etc.

3. A, yellow and purple shapes

4. Irregular trapezoid because it has 4 sides and 2 parallel sides. All sides are different lengths and all angles are different measurements.

Day 8

WHY READING RULES

1. D

2. B

3. Answers will vary. Possible answers include: The number of books made into movies increased from 2011 to 2013, stayed the same from 2013 to 2015, and decreased from 2015 on.

4. C

5. Diary of a Wimpy Kid, Diary of a Wimpy Kid: Rodrick Rules, Diary of a Wimpy Kid: Dog Days

6. So far, 3 years have elapsed between the publishing of a Diary of a Wimpy Kid book and its film adaptation.

7. The Wonderful Wizard of Oz; 1900; 2018 – 1900 = 118 years ago

9. D

10. B

**Day 9**

**TOXIC DISCOVERIES**

1A. 2 hundreds
1B. multiplication
1C. 4 ones × 2 hundreds = 8 hundreds
1D. 4 × 200 = 800

2. 800 × 3 = 2,400 venomous flea species

3A. 2 hundreds × 3 ones = 6 hundreds
3B. 200 × 3 = 600

4. 3,500 × 2 = 7,000 venomous snails and slugs

5A. 2 tens × 2 thousands = 4 ten thousands
5B. 20 × 2,000 = 40,000 venomous spider species

**Day 10**

**DID DINOS REALLY ROAR?**

1. 13 decibels
2. 17 decibels
3. 7 decibels
4. 80 decibels
5. 188 decibels

**Day 11**

**COMIC BOOK KID**

1A. C

1B. 2 times, or twice

2A. 5

2B. 2

2C. The 4/6 panel was bigger.

**Day 12**

**SPACE TRASH STATS**

1. B, United States
2. D, Japan
3. A, about five times as many satellites as India
4. 2,970 − 1,887 = 1,083 satellites
5. A, More than half of the satellites are not in use.
6. B, Subtract the total number of satellites in the bar graph from 1,887.
7. B, Most space trash is less than 1 cm in size.
8. 750,000
9. You can infer that most non-working satellites are more than 5 years old.

**Day 13**

**HOW FAST CAN THEY GO?**

1. A
2. 10 × b = 40 or 40 ÷ 10 = b; b = 4 times faster
3a. What I know: mosquito speed = 4 mph; human speed = 24 mph

What I want to find out: how many times faster a human is than a mosquito;
The variable is what I am trying to find out.

3b. 4 × f = 24 or 24 ÷ 4 = f; f = 6
3c. A human is 6 times faster than a mosquito.
4a. 6 ÷ s = 6 × 1/2 = s
4b. s = 3 mph; s represents the speed of an American cockroach

5a. Math terms: cheetah and shortfin mako are the fastest; cheetah runs twice as fast
5b. The student used subtraction and found how much faster the cheetah is than the shortfin mako instead of using multiplication or division to find how many times faster. 70 mph ÷ 35 mph = r or 35 mph × r = 70 mph
5c. r = 2

6. You can use Part A to check your answer because it states that the cheetah is twice as fast as the shortfin mako shark, so 35 mph × 2 = 70 mph.
Day 14
HOT WHEELS

1A. Tens Ones . Tenths Hundredths
3 5 . 4 4
3 6 . 3 2

1B. 35.44 seconds
2. Gabriel was faster.

3. 15.14, 15.22, 15.36, 15.62
   Answers will vary. Possible answers: They all finished the race in under 16 seconds; They all have the same value in the tens and ones places.
4. The athletes from England and Germany tied for second place.
   99.89 < 100.82 < 101.79; 100.82 = 100.82

Day 15
CONCERT COMMUNICATOR

Students’ hand and finger positions may vary. Please accept all reasonable answers.
1. Yes, the letter L.
2. Yes. There is an acute angle in the letters K and V and an obtuse angle in the letter Y.
3. Answers will vary. Please accept all reasonable answers.

Day 16
CANDY CREATIONS

1A. ONES . TENTHS HUNDREDTHS
0 . 9 2
0 . 9 7

1B. The red heart weighs more because 7 hundredths is greater than 2 hundredths, which means 0.97 ounces is heavier than 0.92 ounces.

2A. The red jaw breakers weigh more. 1.06 ounces is greater than 0.39 ounces.

2B. The black licorice strings have a greater value in the hundredths place. 9 is greater than 6.

3. Least to greatest: 2.13, 2.14, 2.16, 2.17

4. The second artist is incorrect because 11.094 ounces is less than 11.130 ounces. The shell that weighs 11.130 ounces has a greater value in the tenths place.

Day 17
LEGO BUILDER

1a. 4 × 5 = 20 cubes
1b. 20 × 9 = 180 cubes; This value represents the LEGO building’s volume.

2a. 6 rows
2b. 7 × 6 = 42 cubes
2c. 12 layers
2d. 42 × 12 = 504 cubes; 504 cubic inches or 504 in.³

3. 4 cm × 2 cm × 1 cm = 8 cubic centimeters
4. 2 cm × 1.5 cm × 3 cm = 9 cubic centimeters
5. 9 + 5 = 14 cubic centimeters
   Building designs will vary, however dimensions must represent a volume of 14 cubic centimeters. Possible answers:
   7 cm
   1 cm 2 cm
   2 cm
   3.5 cm

Day 18
THE STORY OF CELL PHONES

1. Yes; Motorola DynaTAC 8000x, Nokia MOBIRA Cityman, iPhone 2G, and Samsung Galaxy s8 have fractional pictos.

2. Yes; Motorola DynaTAC 8000x, Nokia MOBIRA Cityman, iPhone 2G, and Samsung Galaxy s8 have fractional pictos.

4. False
5. Russia
6. A
7. B
8. C
9. Yes. Preteens and kids combined is about 63%, which is less than the 72% of teens.
10a. $6 \div 24 = 0.25$; $0.25 \times 100 = 25$
10b. Answers will vary but students must state that the average class percent is higher or more than the data on the bar graph. Possible answer: The fourth-grade class is about 10% higher than the average percent of kids (1st – 4th grade) who own a cell phone.

Day 19

PUPPET DOCTORS
1a. 3 feet + 3 feet = 6 feet
1b. Number of objects: 3; Number of groups: 2
1c. $3 \times 2 = 6$
2a. Multiplication, because you have 3 groups of 5
2b. $3 \times 5 = 15$ feet of piping
3a. Multiplication or addition
3b. $18 \times 2 = 36$ inches
4. 4 days $\times 35 = 140$ days
5a. $(9$ inches $\times 3) + (18$ inches $\times 2) = 27 + 36 = 63$ inches
5b. A tape diagram could work and would be efficient.

6. $(4 \times 36$ inches $) + (4 \times 60$ inches $) = 144 + 240 = 384$ inches
No, you do not have enough, because $372 < 384$.

Day 20

YO-YO PROS
1. D, acute triangle
2A. Scalene triangle
2B. Obtuse triangle
3. Obtuse scalene triangle
4. Right scalene triangle

Grades 6 and up

Day 1

COZY CAMOUFLAGE
1. $\frac{12$ stitches $}{2$ in. $} = \frac{x}{9$ in. $}$
   $x = \frac{108$ stitches $}{2} = 54$ stitches wide
2. $\frac{15$ stitches $}{3$ in. $} = \frac{x}{6.5$ in. $}$
   $x = \frac{1,275$ stitches $}{3} = 42.5 \approx 43$ stitches
3. $\frac{50$ stitches $}{4$ in. $} = \frac{x}{42$ in. $}$
   $x = \frac{2,100$ stitches $}{4} = 525$ stitches
4. $\frac{3.5$ rows $}{0.5$ in. $} = \frac{x}{6$ in. $}$
   $x = \frac{21$ rows $}{0.5} = 42$ rows of stitches
5. $\frac{11$ stitches $}{2$ in. $} = \frac{x}{8$ in. $}$
   $x = \frac{66$ stitches $}{2} = 33$ stitches across
6. $\frac{160$ stitches $}{32$ in. $} = \frac{x}{1$ in. $}$
   $x = \frac{160$ stitches $}{32} = 5$ stitches per inch
7. Answers will vary. Please accept all reasonable pattern designs.

Day 2

ROBOT DOG VS. REAL DOG

Accept all reasonable answers based on the graph. Answers were found using the original data.
1. $\$3,835.99 = \$3,800$
2A. The service is free for 3 years because the line of the graph is flat, or has no slope from years 0 through 3.
2B. $\frac{\$3,835.99 - \$2,899.99}{6 - 3} = \frac{\$940}{3}$
   $= \$313.33 \approx \$310$ per year
3. See graph to the right.
4. The real dog will cost more after year 2.
5. Answers will vary. Possible answer: An Aibo is a better financial investment because it is less expensive over time.
Day 3
THE K-POP WAVE
1. Mean: \( \frac{7 + 9 + 5 + 7 + 13 + 18}{7} = 66 ÷ 7 = 9.4 \approx 9 \) members
   Median: 5, 7, 7, 9, 13, 18
   Mode: 7
2. Mean: \( \frac{4 + 9 + 8 + 5 + 6 + 5 + 4}{7} = 41 ÷ 7 = 5.9 \approx 6 \) members
   Median: 4, 4, 5, 5, 6, 8, 9
   Mode: 4 and 5
3. Mean: \( \frac{7 + 9 + 5 + 7 + 7 + 13 + 18 + 4 + 9 + 8 + 5 + 6 + 5 + 4}{14} = \frac{107}{14} = 7.6 \approx 8 \) members
   Median: \( \frac{7 + 7}{2} = 7 \)
   Mode: 5 and 7
4. Answers will vary. Possible answers: The female groups on average have fewer members than the male groups; The male groups are typically larger than the female groups.

Day 4
NOT SO FAR, FAR AWAY
1. See below for the labeled map.
2. Redwood forests, California; Endor
3. Hardangerjøkulen glacier, Norway; Hoth
4. Salar de Uyuni, Bolivia; Crait
5. See below for the labeled map.

Day 5
PREDICTING YOUR PLAYLIST
1. \( P(\text{Selena Gomez}) = \frac{3}{8} = 0.38 = 38\% \)
2A. \( P(\text{Shawn Mendes in Playlist 1}) = \frac{2}{8} = 0.25 = 25\% \)
2B. \( P(\text{Shawn Mendes in all playlists}) = \frac{3}{32} = 0.09 = 9\% \)
3A. \( P(\text{Beyoncé}) = \frac{2}{4} = 0.5 = 50\% \)
3B. \( P(\text{Beyoncé and John Legend}) = \frac{1}{4} = 0.25 = 25\% \)
4. \( P(\text{Maroon 5 song}) = \frac{5}{32} = 0.16 = 16\% \)
5. 8 songs total – 2 songs = 6 songs
   \( P(\text{BTS song}) = \frac{2}{6} = \frac{1}{3} = 33\% \)

Day 6
SHOOTING FOR SUCCESS
1. \[
\begin{align*}
\text{x} & | f(x) = x - 0.05(x)^2 + 4 \\
0 & f(0) = 0 - 0.05(0)^2 + 4 = 4 \\
5 & f(5) = 5 - 0.05(5)^2 + 4 = 7.75 \\
10 & f(10) = 10 - 0.05(10)^2 + 4 = 9 \\
15 & f(15) = 15 - 0.05(15)^2 + 4 = 7.75 \\
20 & f(20) = 20 - 0.05(20)^2 + 4 = 4
\end{align*}
\]
2. 
3. (10, 9)
4. The \( y \)-intercept of 4 represents the height from which Ixhelt threw the ball.
5. The ball will hit the ground at around 23 feet. Answers will vary: please accept all reasonable explanations. Students may solve for the \( x \)-value using the function, graph the next \( x \)-value at 25 to see at which point the line crosses at 0, extend the parabola line, guess and check by plugging different \( x \)-values into the function, etc.
### Day 7
#### THE WRITE STUFF

1. \( \frac{52,500 \text{ sandwiches}}{5 \text{ days}} = 10,500 \text{ sandwiches per day} \)

2. \( \frac{2100 \text{ pencils}}{15 \text{ min}} = 140 \text{ pencils per minute} \)

3. \( \frac{4,200 \text{ pencils}}{2.5 \text{ hr}} \times \frac{1 \text{ hr}}{60 \text{ min}} = 28 \text{ pencils per minute} \)

4. \( \frac{480,000 \text{ pencils}}{4 \text{ weeks}} \times \frac{1 \text{ pack}}{12 \text{ pencils}} = 10,000 \text{ packs per week} \)

5. \( \frac{24,000 \text{ pencils}}{1 \text{ day}} \times \frac{1 \text{ pack}}{4 \text{ pencils}} = 6,000 \text{ 4-packs per day} \)

### Day 8
#### DON'T EAT THE ART!

1. \( 9 + 2 + 4 + 5 = 20 \text{ total jelly beans} \)

   20:5 = 4:1; whole to part

2. \( 4:10 = 2:5; \text{ part to part} \)

3A. \( 130 + 60 + 25 = 215 \text{ total jelly beans} \)

   130:215 = 26:43

3B. \( 60:25 = 12:5 \)

4A. \( 130:10 = 13:1 \)

4B. \( 636 - (138 + 130 + 10) = 358 \text{ yellow jelly beans} \)

358:636 = 179:318

### Day 9
#### CREATING COCO

1. circle
2a. triangle
2b. rectangle
2c. trapezoid
3. circle, rectangle
4. cone, triangular prism, square pyramid
5. circle
6. Answers will vary. Please accept all reasonable 3-D shapes and 2-D cross sections.

### Day 11
#### PROTECT YOUR PETS!

1. See dot plot below.

### Day 13
#### KILLER PLANTS

1. \( 3.14 \times (1 \text{ cm})^2 \times 7.8 \text{ cm} = 24.49 \text{ cm}^3 \)

2. \( \frac{4}{3} \times 3.14 \times (2 \text{ cm})^3 = 33.49 \text{ cm}^3 \)

3. \( 3.14 \times (1.85 \text{ cm})^2 \times \frac{18}{3} \text{ cm} = 64.48 \text{ cm}^3 \)

4. \( 3.14 \times (0.8 \text{ cm})^2 \times 6.2 \text{ cm} = 12.46 \text{ cm}^3 \)

5A. \( \frac{4}{3} \times 3.14 \times (3 \text{ cm})^3 = 113.04 \text{ cm}^3 \)

5B. \( 3.14 \times (2 \text{ cm})^2 \times 7.7 \text{ cm} = 96.71 \text{ cm}^3 \)

5C. \( 113.04 - 96.71 = 16.33 \text{ cm} \)

The \( N. \ bicalcarata \) pitcher on the ground has a greater volume by 16.33 cubic centimeters.

6A. \( 3.14 \times (2.1 \text{ cm})^2 \times 6.5 \text{ cm} = 90.01 \text{ cm}^3 \)

6B. \( 3.14 \times (2.3 \text{ cm})^2 \times \frac{8 \text{ cm}}{3} = 44.29 \text{ cm}^3 \)

7. Lower pitchers (cylindrical):

   \( 3.14 \times (3.5 \text{ cm})^2 \times 12.9 \text{ cm} = 496.20 \text{ cm}^3 \)

Hanging pitchers (cone-shaped):

   \( 3.14 \times (3.6 \text{ cm})^2 \times \frac{22.5}{3} \text{ cm} = 305.21 \text{ cm}^3 \)

The cylindrical lower pitcher has a greater volume.

8. Answers will vary. Possible answer: The lower ground pitchers tend to have greater volumes.
Day 15
DELICIOUS DESIGNS

1A. D and E
   C and F
1B. B and C

2A. Angle A: $180^\circ - 62^\circ = 118^\circ$
2B. They both measure 62°.
3. $90^\circ - 43^\circ = 47^\circ$
4A. Angles D and E are adjacent and supplementary.
4B. Angle D: $180^\circ - 132^\circ = 48^\circ$
5. Answers will vary but designs must include 3 intersecting lines with 2 properly labeled adjacent and congruent angles.

Day 16
DINO DUDE

1. $6:(17 - 6) = 6:11$
2. $200 \times 0.57 = 114$ bones
3. $6 \text{ feet} \times 12 \text{ inches} = 72 \text{ inches}$
0.5 meters $\times \frac{3.3 \text{ feet}}{1 \text{ meter}} = 1.65 \text{ feet}$
1.65 feet $\times \frac{12 \text{ inches}}{1 \text{ foot}} = 19.8 \text{ inches}$
72 inches $\div 19.8 \text{ inches} = 52.2$ inches taller
4. $\frac{72,270,625 \times 8.43}{77,734,925.86} = 77,374,926$ tickets
5. $6.2 \text{ feet} = \frac{15}{2} \text{ inches}$
$\frac{15}{8} \text{ inches} = 1.625 \text{ inches}$
6.2 feet $\div 1.625 \text{ inches} = 3.82 \text{ feet per inch}$
So the scale is: 1 inch $= 3.82$ feet

Day 18
IT’S SLIME TIME!

See budget chart below.
1. Slime ingredients: $72 + $100 + $27 = $199
2A. Hotel: $2 \times $140 = $280
2B. Travel & Hotel: $76 + $280 = $356
3. Total expenses: $199 + $356 + $100 = $655
4. Ice mountain: $10 \times 31 = $310
   Galaxy: $10 \times 59 = $590
5. Fries With Ketchup: $15 \times 18 = $270; Total income: $310 + $590 + $270 = $1,170
6. Net profit: $1,170 $-$ $655 = $515

<table>
<thead>
<tr>
<th>Slime Mania Planning Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXPENSES</strong></td>
</tr>
<tr>
<td>Slime Production</td>
</tr>
<tr>
<td>Travel &amp; Hotel</td>
</tr>
<tr>
<td>Booth Fee</td>
</tr>
<tr>
<td><strong>TOTAL EXPENSES:</strong></td>
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</tbody>
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Day 20
GOING, GOING, GONE!

1a. about 108 mph
1b. about 42 mph
2. All his home runs had exit velocities greater than 95 mph.
3a. Upward trend; The higher the exit velocity, the farther the balls traveled.
3b. There are two outliers at about 105 mph and 108 mph. (The point (42, 40) is not an outlier because it follows the trend.)
4. Accept all reasonable answers explaining why managers should or shouldn’t use the statistic. For example, based on the graph, batters that hit balls with greater exit velocities will hit the ball farther, so the batters should be positioned in the lineups where they have the best chance to drive in runs.