Day 1

WHALES IN THE CITY

1. September

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

<table>
<thead>
<tr>
<th>Number of Calls</th>
<th>8/18</th>
<th>8/19</th>
<th>8/20</th>
<th>8/21</th>
<th>8/22</th>
<th>8/23</th>
<th>8/24</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td></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

\[
\begin{array}{c}
0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\
\hline
\text{Tilapia} & & & & & & & & & & \\
\text{Grasshoppers} & & & & & & & & & &
\end{array}
\]

2B. Grasshoppers

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

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

Day 5

EXTRAORDINARY EYES

5. 12 owl eyes

\[
\begin{array}{cccccccc}
\text{X} & \text{X} \\
\text{X} & \text{X} \\
\text{X} & \text{X} \\
\text{X} & \text{X} \\
\text{X} & \text{X} \\
\text{X} & \text{X} \\
\end{array}
\]

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.

\[
\begin{array}{cccccccc}
\text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X}
\end{array}
\]

\[
\begin{array}{cccccccc}
\text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X}
\end{array}
\]

\[
\begin{array}{cccccccc}
\text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X}
\end{array}
\]

\[
\begin{array}{cccccccc}
\text{X} & \text{X} & \text{X} & \text{X}
\end{array}
\]

4. \( 2 \times 5 = 10 \) eyes

\[
\begin{array}{cccc}
\text{X} & \text{X} & \text{X} & \text{X}
\end{array}
\]

\[
\begin{array}{cccc}
\text{X} & \text{X} & \text{X} & \text{X}
\end{array}
\]

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. \( 6 \text{ cm} + 6 \text{ cm} + 6 \text{ cm} + 6 \text{ cm} = 24 \text{ cm} \)
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 cm \( \div 2 \) (sides) = 6 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 \( \frac{4}{6} \) 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. \( 10 \times b = 40 \) or \( 40 \div 10 = b \); \( b = 4 \) 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. \( 4 \times f = 24 \) or \( 24 \div 4 = f \); \( f = 6 \)
3c. A human is 6 times faster than a mosquito.
4a. \( 6 \div s = 6 \times \frac{1}{2} = s \)
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  | 3   | . 2 |
3   | 6   | . 3  | 4   | . 4 |

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.

Grades 6 and up

Day 1
COZY CAMOUFLAGE

1. 12 stitches = \( \frac{x}{2} \) in.
   \[ x = \frac{108 \text{ stitches}}{2} = 54 \text{ stitches wide} \]

2. 15 stitches = \( \frac{x}{3} \) in.
   \[ x = \frac{127.5 \text{ stitches}}{3} = 42.5 = 43 \text{ stitches} \]

3. 50 stitches = \( \frac{x}{4} \) in.
   \[ x = \frac{2100 \text{ stitches}}{4} = 525 \text{ stitches} \]

4. 3.5 rows = \( \frac{x}{0.5} \) in.
   \[ x = \frac{21 \text{ rows}}{0.5} = 42 \text{ rows of stitches} \]

5. 11 stitches = \( \frac{x}{2} \) in.
   \[ x = \frac{66 \text{ stitches}}{2} = 33 \text{ stitches across} \]

6. 21 rows = \( \frac{x}{3} \) in.
   \[ x = \frac{84 \text{ rows}}{3} = 28 \text{ rows tall} \]

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. $3,835.99 – $2,899.99
   \[ 6 – 3 = $940 \]
   \[ = $313.33 = $310 \text{ per year} \]

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: \( (7 + 9 + 5 + 7 + 7 + 13 + 18) ÷ 7 = 66 ÷ 7 = 9.4 \approx 9 \) members
   Median: 5, 7, 7, 9, 13, 18
   Mode: 7

2. Mean: \( (4 + 9 + 8 + 5 + 6 + 5 + 4) ÷ 7 = 41 ÷ 7 = 5.9 \approx 6 \) members
   Median: 4, 4, 5, 5, 6, 8, 9
   Mode: 4 and 5

3. Mean: \( (7 + 9 + 5 + 7 + 7 + 13 + 18 + 4 + 9 + 8 + 5 + 6 + 5 + 4) ÷ 14 = 107 ÷ 14 = 7.6 \approx 8 \) members
   Median: (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. \( P(\text{Maroon 5 song}) = \frac{5}{32} \approx 0.16 = 16\% \)
5. 8 songs total – 2 songs = 6 songs  
P(BTS song) = \( \frac{2}{6} = 0.3 = 33\% \)

Day 6

SHOOTING FOR SUCCESS

1. \( f(x) = x - 0.05(x)^2 + 4 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>( f(0) = 0 - 0.05(0)^2 + 4 )</th>
<th>( f(5) = 5 - 0.05(5)^2 + 4 )</th>
<th>( f(10) = 10 - 0.05(10)^2 + 4 )</th>
<th>( f(15) = 15 - 0.05(15)^2 + 4 )</th>
<th>( f(20) = 20 - 0.05(20)^2 + 4 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4</td>
<td>7.75</td>
<td>9</td>
<td>7.75</td>
<td>4</td>
</tr>
</tbody>
</table>

Day 7

THE WRITE STUFF

1. \( \frac{52,500 \text{ sandwiches}}{5 \text{ days}} = 10,500 \text{ sandwiches per day} \)
2. \( \frac{2,100 \text{ pencils}}{15 \text{ min}} = 140 \text{ pencils per minute} \)
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. \( 4:10 = 2:5; \) 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
**Learn At Home Answer Key**

**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.  
2. 11; it has the tallest column/most number of dots  
3. 10, 16, and 17  
4. Answers may vary. Possible answer: Small; 11 inches had the highest frequency of dots and based on the span of measurements it would most likely fall in the range of small. See size ranges in 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. \(\frac{2}{3} \times 3.14 \times (2 \text{ cm})^3 = 33.49 \text{ cm}^3\)  
3. \(3.14 \times (1.85 \text{ cm})^2 \times \frac{16 \text{ cm}}{3} = 64.48 \text{ cm}^3\)  
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 \(N. \text{ bicalcarata}\) 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): \(3.14 \times (3.6 \text{ cm})^2 \times \frac{22.5 \text{ cm}}{3} = 305.21 \text{ cm}^3\)  
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  
1B. C and F  
2A. Angle A: \(180^\circ - 62^\circ = 118^\circ\)  
2B. They both measure \(62^\circ\).  
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.