Parallel Tasks

<u>Learning Objective</u>: (Common Core 6.SP) Develop an understanding of statistical variability. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

Task 1:	Task 2:
A data set has a mean of 50 and a median of 20. If there are 10 pieces of data, what could the values of the data be?	A data set has a mean of 30 and a median of 20. If there are 5 pieces of data, what could the values of the data be?

<u>Learning Objective</u>: (Common Core 7.G) Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

Task 1:	Task 2:
A cube has a volume of 729 cubic units. What are the dimensions and the surface area?	A prism as a volume of 90 cubic units and a surface area of 146 square units. What could the dimensions be?

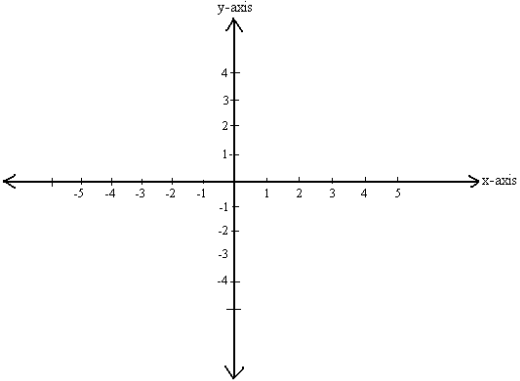Create your own tasks based on a learning objective of your choice:

<u>Learning Objective</u>:

Task 1:	Task 2:

Open Questions

<u>Learning Objective</u>: (Common Core 8.EE) Graph proportional relationship, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

Standard Question	**Open Question**
Graph $4y=2x+8$	Describe the similarities and differences between these linear equations: $4y=2x+8$ and $3y=-6x+6$

Learning Objective: (Common Core 7.8b) Represent sample spaces for compound events using methods such as organized lists, table and tree diagrams. (Common Core 7) Develop a probability model and use it to find probabilities of events.

Standard Question	Open Question
Use a tree diagram to show the outcomes of rolling a six-sided die and flipping a coin.	Use a tree diagram to show the possible outcomes of an experiment. Your solution should describe the experiment that your tree diagram is illustrating.

Tiered Lessons

<u>Learning Objective</u>: (Common Core 8.G) Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

(Show a short video clip of the World Series). Give students a diagram of a baseball diamond with regular dimensions. Students will be given different tasks to solve based on their learning needs.

Group A:
Identify and solve at least two situations that would require you to use the Pythagorean Theorem to find distances on the baseball diamond.   (open-ended)

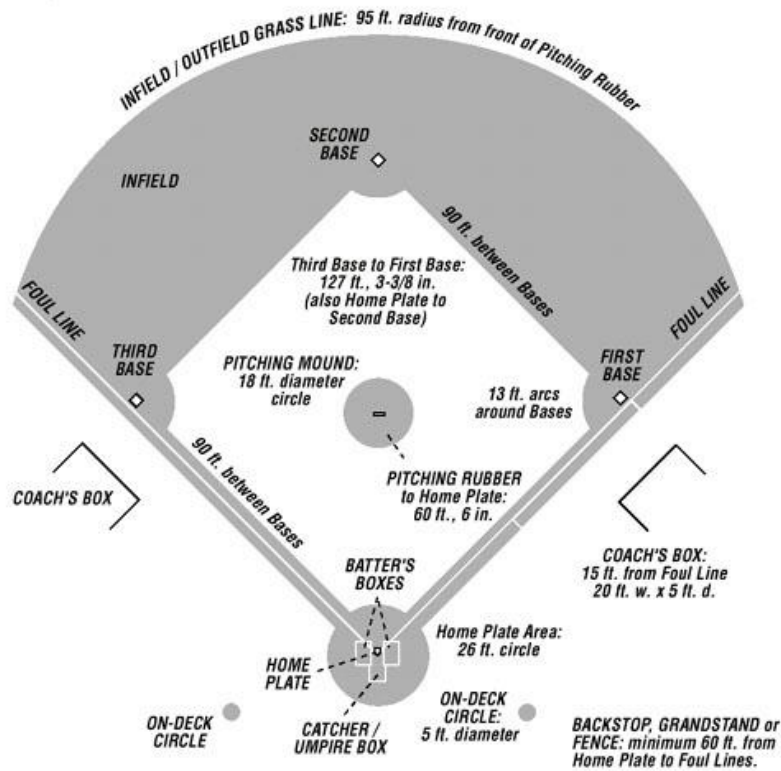| Group B: |
| :-: |
| Suppose the second baseman is standing on the second base with the ball and a runner is running toward home plate. How far will the second baseman need to throw the ball to throw the runner out at home plate?
 (slightly structured) |

Group C:

Suppose the second baseman is standing on second base with the ball and a runner is running toward home plate. How far will the second baseman need to throw the ball to throw the runner out at home plate? Use the following suggestions and questions to work through the problem:

1. On your diagram of the baseball diamond, draw a line between second base and third base, another line between third base and home plate, and another line between second base and home plate.
2. What shape have you drawn? What do you know about the distance between bases? Which distance are you trying to find?
3. Use the Pythagorean Theorem ($a^2+b^2=c^2$) to help you find the unknown distance. (most structured)

INFIELD / OUTFIELD GRASS LINE: 95 ft. radius from front of Pitching Rubber

SECOND BASE

INFIELD

90 ft. between Bases

Third Base to First Base:
127 ft., 3-3/8 in.
(also Home Plate to
Second Base)

FOUL LINE

THIRD BASE

PITCHING MOUND:
18 ft. diameter
circle

13 ft. arcs
around Bases

FIRST BASE

FOUL LINE

90 ft. between Bases

PITCHING RUBBER
to Home Plate:
60 ft., 6 in.

COACH'S BOX

BATTER'S BOXES

COACH'S BOX:
15 ft. from Foul Line
20 ft. w. x 5 ft. d.

HOME PLATE

Home Plate Area:
26 ft. circle

ON-DECK CIRCLE

CATCHER / UMPIRE BOX

ON-DECK CIRCLE:
5 ft. diameter

BACKSTOP, GRANDSTAND or
FENCE: minimum 60 ft. from
Home Plate to Foul Lines.

References

Baseball Diamond downloaded from
http://www.baseballalmanac.com/stadium/baseball_field_construction.shtml

Problems adapted from: Van de Walle, J., Bay-Williams, Lovin, L.H. & J. Karp, K. (2014). *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 6-8: Volume III.* Second Edition. Boston: Pearson Education. ISBN: 978-0-13-282486-6.

Muschla, J., Muschla, G., & Muschla, E. (2012). *Teaching the Common Core Math Standards with Hands-On Activities: Grades 6-8*. San Francisco, CA: Jossey-Bass. ISBN: 978-1-118-10856-7.

Common Core Standards for Mathematics (2010). http://www.corestandards.org/