

INTRODUCING YOUR CHILD TO STEM

Science, Technology, Engineering, and Mathematics (STEM) education provides young adults with the opportunity to participate in many themed **hands-on activities**, including those with connections to sports, history, and other subjects.

VOCABULARY TO KNOW

LIFT

The force that moves an object upward and off of the ground.

Activities involving the Zip Flyer construction toys by Hexbug help individuals learn more about **math**, **physics**, and **engineering** by engaging in activities that are useful and enjoyable while providing them hands-on experiences in those key areas.

This activity, Zip Lander, provides a fun and interesting way for students to practice **engineering** and to begin considering the **physics** involved in flying. Scorekeeping also includes some basic data management and analysis to figure out who wins the game.

GENERAL SOLUTIONS

Although the setup for Zip Lander recommends playing in front of a wall, the wall is optional. The wall helps to keep discs closer to the target, thereby making the game easier.

The following is an example score table. The symbol, \approx , indicates which measure was a calculated approximation. If playing alone, the Player #2 columns could be used by the same player for a second game in order to try to beat their previous scores.

Round 1	Player #1		Player #2	
	Distance from Target	Points Earned	Distance from Target	Points Earned
Blue Disc	\approx 2 feet	5		
Green Disc	\approx 10 feet	0		
Orange Disc	\approx 1.17 feet	10		
Total Score for Round 1		15	vs.	
Round 2	Player #1		Player #2	
	Distance from Target	Points Earned	Distance from Target	Points Earned
Blue Disc	\approx 2.46 feet	5		
Green Disc	\approx 5 feet	2		
Orange Disc	\approx 1 foot	10		
Total Score for Round 2		17	vs.	

EXTEND YOUR LEARNING

DISCUSS

What strategies seem to work best for landing the disc closest to the target?

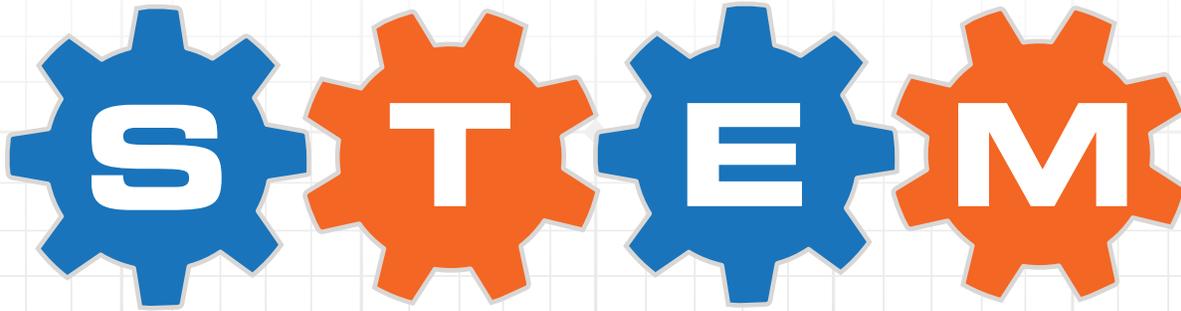
APPLY

Draw a diagram showing the best approach and then test it with a new player.

EXPLORE

You can explore additional VEX Hexbug builds and investigations here:
<https://www.hexbug.com/vex>

STEM STANDARDS ADDRESSED



MS-ESS1-1

Patterns can be used to identify cause and effect relationships.

ISTE1.1B

Students build networks and customize their learning environments in ways that support the learning process.

3-5-ETS1-1

Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.

CCSS.MATH.PRACTICE.MP1

Make sense of problems and persevere in solving them.

3-PS2-1

Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

ISTE1.1D

Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

MS-PS3-2

Develop a model to describe unobservable mechanisms.

CCSS.MATH.PRACTICE.MP3

Construct viable arguments and critique the reasoning of others.

3-PS2-2

Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

ISTE3.3D

Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions.

MS-ETS1-4

Develop a model to generate data to test ideas about designed systems, including those representing inputs and output.

CCSS.MATH.CONTENT.2.MD.A.3

Estimate lengths using units of inches, feet, centimeters, and meters.

MS-PS2-2

Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

ISTE4.4D

Students exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems.

CCSS.MATH.CONTENT.3.MD.B.4

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.

CCSS.MATH.CONTENT.5.MD.A.1

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

STANDARDS REFERENCED

MATH

Common Core Standards for Math
<http://www.corestandards.org/math/>

SCIENCE & ENGINEERING

Next Generation Science Standards
<http://www.nextgenscience.org/>

TECHNOLOGY

International Society for Technology in Education
<http://www.iste.org/standards/>