LITTLE BIG MINDS
STEAM For Our Youngest Learners

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Identify several big ideas in early childhood science and mathematics, and examine the role of executive functioning skills in STEAM learning.

Understand the charge for early childhood educators in developing confident, proficient, and fluent STEAM students.

Explore a unit of study on simple machines. Combining content with skills, the STEAM-based activities explored in this session provide an opportunity to nurture curiosity and discovery in our youngest learners.
3-DIMENSIONAL SCIENCE

Science and Engineering Practices
- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

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<th>Life Science</th>
<th>Earth &amp; Space Science</th>
<th>Physical Science</th>
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<td>From molecules to organisms: Structures and processes</td>
<td>Earth's place in the universe</td>
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<td>Ecosystems: Interactions, energy, and dynamics</td>
<td>Earth's systems</td>
<td>Motion and stability: Forces and interactions</td>
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<td>Heredity: Inheritance and variation of traits</td>
<td>Earth and human activity</td>
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<td>Biological evolution: Unity and diversity</td>
<td>Waves and their applications in technologies for information transfer</td>
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Engineering, Technology, and the Application of Science

Crosscutting Concepts
- Patterns
  - Cause and effect
- Scale, proportion, and quantity
- Systems and system models
- Energy and matter
- Structure and function
- Stability and change
EARLY CHILDHOOD MATH FOUNDATIONS

Sets
Pattern
Number Sense
Counting & Number Operations
Measurement
Data Analysis
Spatial Relationships & Shape
EXECUTIVE FUNCTIONING SKILLS AND STEAM

Simple Machines are mechanical devices that are used to make forceful tasks easier by increasing the mechanical advantage. This means that the output force—the amount of work performed by the simple machine—is greater than the input force—the amount of force the user puts into the machine.
RAMP RACING
INCLINED PLANE
CARRY AND CONSTRUCT
PULLEY

CATAPULT LAUNCH
LEVER
MOVIN' ON UP
SCREW

WHERE THE RUBBER MEETS THE ROAD
WHEEL & AXLE
MAKING THE CUT
WEDGE
5 MINUTE STATIONS

Read the Task Card at your station.
Play with the materials.
Consider the Focus Questions for each activity.
INCLINED PLANE: RAMP RACING

Learners will explore how the angle and height of a ramp impacts the distance a car travels through scientific inquiry, while also using basic counting and measurement techniques to quantify their data.
LEVER: CATAPULT LAUNCH

Learners will explore catapults – a first class lever – and use this piece of technology to launch a load (pompoms). Students will collect, sort and graph data, and make comparisons to analyze their results.
WHEEL & AXLE: WHERE THE RUBBER MEETS THE ROAD

Learners will use two different types of wheeled vehicles—a wagon and a wheelbarrow—to move building materials down the road to their construction site and analyze how this simple machine makes this job easier.
5 MINUTE STATIONS

Read the Task Card at your station.
Play with the materials.
Consider the Focus Questions for each activity.
Learners will use a pulley system to lift “heavy” materials needed for construction. Through problem solving, mathematics, and play, students will work together to engineer a new building from blueprint to structure.
SCREW: MOVIN' ON UP

In this investigation, learners use an Archimedes Screw to move various materials. By definition, a screw is an inclined plane that has been wrapped around a cylinder. Learners will predict which materials will be moved most easily, and also analyze data by sorting the materials from most to least.
A wedge is a simple machine that is used to separate, or spilt, an object. In this activity, learners will explore and test a number of different tools, predict whether or not they will be able to cut some art dough, and then sort them based on their ability to do so.
QUESTIONS?

THANK YOU!

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