MEASURING FRICTION AND PROGRAMMING

Grades K-3/4-8

TEST HOW SLIPPERY MATERIALS ARE

K-3 Students practice experimenting with friction using a variety of materials.
4-8 Students will program their robots.

SAIN UU!
5 min

SNACK & FREE PLAY
30 min

STORY & SNACK
15 min

STEM TIME
50 min

Materials:

- Blocky
- Roxy Ramp
- Protractors
- Scissors
- Pencils
- Paper
- A few flat materials for students to test (ex: plastic bag, construction paper, felt cloth, paper towel)

Sain uu is Mongolian for hello! (pronounced say-noo)

Greet your students. Be friendly. Use their name, ask a question, give a high five, or thumbs-up! Take roll. Mark down which students took a snack and tally how many snacks were given out.

Enjoy Free Play:

Students enjoy playing outside and eating their snack.

Read the story:

Read the story of the day. Older students may choose to read their own books.

Grades K-3: Measuring friction

Students practice experimenting with friction using a variety of materials.

Instructions:

1. Divide students into groups of two. Have students cut out their protractors.
Ask: Have you ever pushed something heavy across a floor, like a big box sitting on carpet?
Explain: Friction is what keeps it from sliding as easily as something on wheels. The floor drags against the bottom surface of the object and the heavier the object is, the more drag (or slow down) there is.
2. Have each group find 4 flat materials around the classroom to test. Potential materials might be a plastic bag, construction paper, felt cloth or paper towels.
Ask: How would you measure friction? You don't need to come up with a number like if you were measuring length with a ruler, but how would you tell if something has low friction or high friction?
Example: I could feel it with my fingers and see if it was slippery or bumpy. I could slide it against something else and see how it moves.
3. Partner 1 puts the material to be tested onto the bottom of Blocky, places Blocky on Roxy ramp and slowly lifts one end of the ramp watching for the moment that Blocky starts to slip. When they see it start to slip, they hold the ramp in place. Partner 2 can help measure the angle and write down the material and angle at which it began to slip.
4. Partners can share roles so everyone has the opportunity to do the sliding and the measuring!

STEM TIME
50 min

Materials:

- Chromebooks
- Robots
- Legos

Grades 4-8: Program Your Robot

Instructions:

STEM Coaches will go to the portal and help students with the next Edison programming lesson they are on. Students may choose to build a Lego creation on top of their robots.

Link to portal: https://www.stemexpandedlearning.com/robotics

SPORTS/GAMES
30 min

* Older students may choose to practice their sport instead of playing the game of the day.

Materials:

- Cones to designate two ends of play area

Robot Races

Players will attempt to move their robots from one end of the play area to the other.

Instructions- Organize students into teams of two players each. One player will be a robot mover and the other player will be a robot. In this game the only way the robot can move is if the mover moves them. To play the game, have each team stand at one end of the play area. When the STEM Coach says “Go!” the race will begin. The teams will race from one end of the play area to the other. To race, the robot mover will have to move the legs and feet of their robot all the way across the play area. The first team to make it to the other end wins the race! The game can be repeated with new teams. The game can also be adapted into a relay format where there are larger teams and two players from each team go at a time. When one set of players reaches the other side, the next set can go until the entire team has made it to the other side.

HOMEWORK/ FREEPLAY
20 min

Instructions:

Allow your students some homework time. If they need help let them know you can help them. If they do not have any homework they can have some reading time, or they can have free time to go outside and play.

CLEAN UP/ DISMISSAL
5 min

Clean up/pack up/dismissal

Clean up, pack up and practice lining up.