STEMTaught

Summer Camp
Into the Outback Day 10

4-8TH GRADE

WELCOME
(5 min)

Instructions: Welcome your students to camp. Say: "Today we get to play a fun game, use microscopes and build forts!"

Remind students they have the opportunity to earn sand dollars when they complete a task, help another student, help set up or clean up, write in their journal, read a book, etc. Tally the amount of sand dollars that each student earned from helping and record it on the weekly pay role sheet.

GAME TIME
(25 min)

Materials:
- Basketball

KICKBALL

Objective: Teams try to score home runs by kicking a ball and running the bases.

Instructions: In a large field, set up the bases in a baseball diamond form. There will be a first, second, and third base, as well as a home base. There should be about 40-60 ft. between each base. Organize the players into two teams. One team will be out in the field with one player at each base, and the others spread out in different positions. The other team will line up to kick. To play, the pitcher will roll the ball to the kicker who will be standing at home plate. If the kicker gets three strikes or four fouls, they are out. If they can kick the ball into the field, then they get to run to first base. The team in the field runs to get the ball and can get the kicker out in 3 ways. One is by catching the ball in the air when it is kicked. Two, by throwing the ball to the first base player and then having them touch the plate before the kicker gets to the plate. Three, by tagging the kicker with the ball, below the head. The kicking team scores a point with every home run they get. They can get a home run when a kicker makes it through all of the bases and back to home plate. When the kicking team has three out, this is half an inning. At this point, the teams will switch places. The game can go on for as many innings as the teacher chooses. The team with the most points at the end of the game wins.

ART TIME
(60 min)

Materials:
- Puzzle

PUZZLES

Say: "Today we are going to solve a puzzle together! Solving puzzles is a fantastic way to develop problem solving and data organization skills. These skills are important in coding and math."

Instructions:
1. Choose a puzzle for the students to solve together. Some students may be familiar with puzzles, and others may have never done a puzzle like this before. When solving a puzzle there are some techniques that can be used. Share the following techniques with the students.
2. Flip over all the pieces.
3. Find all of the border pieces. These are the pieces with a flat edge.
4. Form the border.
5. Gather pieces that look like they belong together.
6. Form little piles of these pieces.
7. Try putting them together in the space they look like they might belong.
8. Experiment and work as a team. Little by little the puzzle will come together.

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STEM TIME

(90 min)

Materials:

- Meeka microscopes
- Student lab sheet
- Colored pencils
- Camp journal
- Various warm clothing items

WARM CLOTHING

Say: "Humans often look to nature to come up with solutions for problems or needs we might have. We can be inspired by nature's interesting inventions to solve a human problem using nature's solutions. There are many different kinds of synthetic materials in our warm winter clothes. By observing them under Meeka microscope, we can contrast how they are different from or similar to natural insulators. How far have we been able to mimic nature? How are these materials different under a microscope? How do they help keep us warm? Let's explore our warm clothes and study how they are able to keep us warm."

Instructions: Help your students observe many different kinds of fabric (cotton and wool versus synthetic fibers) by viewing them under Meeka microscope. Note: If you are conducting this lab in a season that is not cold, please send a note home with your students asking them to bring in one item of warm clothing from home before this lab. Students can feel free to bring in coats, sweaters, hoodies, wool socks, beanies, or scarves. Try to have some items from your wardrobe available as well (preferably a mix of natural and synthetic things, such as a waterproof jacket versus fleece and cotton) in case a student forgets.

1. Talk to students about the terms natural and synthetic. Emphasize that fabrics like wool or cotton come from plants and animals, and synthetic fibers are made by humans. Synthetic materials have a lot of the qualities that natural materials do. Say: "We are going to study the microscopic structure of your winter clothes."
2. Lead a class discussion and ask students to make predictions about how their winter clothes keep them warm.
3. Students observe their clothes. Allow students to be excited and share what they see, with you and with their friends. Get curious about different types of fabric and share the excitement of getting a closer look with a microscope. Students might observe tufts, fibers, thread, and tangled felt.
4. Ask students if they think the material is synthetic or natural.
5. Students draw what they see under the microscope. Have some colored pencils available as there are so many interesting formations and weaves. Encourage them to take time with their drawing and shading.
6. At the end, read out what material the clothing is made out of on the label. Let students bring you their items of clothing if they need help. Talk to students about the way clothes often contain a mix of synthetic and natural fibers, and how one isn't necessarily better than the other. All kinds of fabrics have their own role, and our investigation is about how they can keep us warm.

ENGINEERING

(60 min)

Materials:

- Building Barbs
- Straws
- Scissors
- Trays

MAKE A SKYSCRAPER USING BUILDING BARBS

Objective: Students make a tall structure using Building Barbs. How high can you build a self standing structure?

Instructions:

1. Give each student a tray filled with Building Barbs and straws. Students can work as a group or on their own. Allow students to choose who they work with.
2. Inform your students that they are going to be making a tall structure that can stand on its own. Say: "Students at one school built a tower out of barbs that was taller than their multipurpose room and it stood on its own! They built it on the ground and then stood it up. Let's see who can build the tallest structure!"
3. Help students if needed. Remind them that they can build a large base that repeats itself but ultimately let students figure things out.
4. Have students walk around to see what their classmates have built. Congratulate the group that built the tallest tower.

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