

## DECEMBER 2020 ACTIVITIES AND LEARNING OUTCOMES – UM

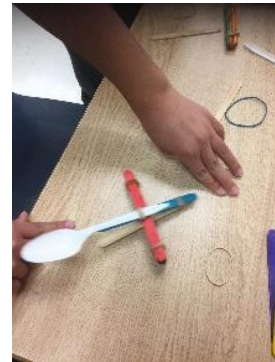
### **ENGINEERING – CATAPULT STRUCTURE**

Children were observed showing a keen interest in building structures. Teachers enhanced the children's learning by sharing a short video on the basics of engineering and how large structures are made with smaller units (catapult – December).

*What is a catapult?*

A **catapult** is a ballistic device used to launch a projectile a great distance without the aid of gunpowder or other propellants – particularly various types of ancient and medieval siege engines. Today, catapults can be used to launch airplanes from aircraft carriers, or to demonstrate physics and mathematics to students.

A **catapult** uses the sudden release of stored potential energy to propel its payload. We tested the effectiveness of our catapults by using different payloads like styrofoam, cottonballs and marshmallows. Teachers use catapults to demonstrate physics with catapults' projectile motion. It gives students the opportunity to observe gravity as well as potential and kinetic energy at work. Testing catapult designs offers insight into material properties.



**Teacher: “What do you think will work as a payload?”**

**better**

**Student 1: “I’m going to try them all, but my guess would be the marshmallow because it’s denser.”**

**Student 2: “We’re going to actually test them all and see what works best. It’s going to be a contest.”**

**Teacher: “You can also go ahead and test other random objects as payloads from around the classroom and document your findings.”**

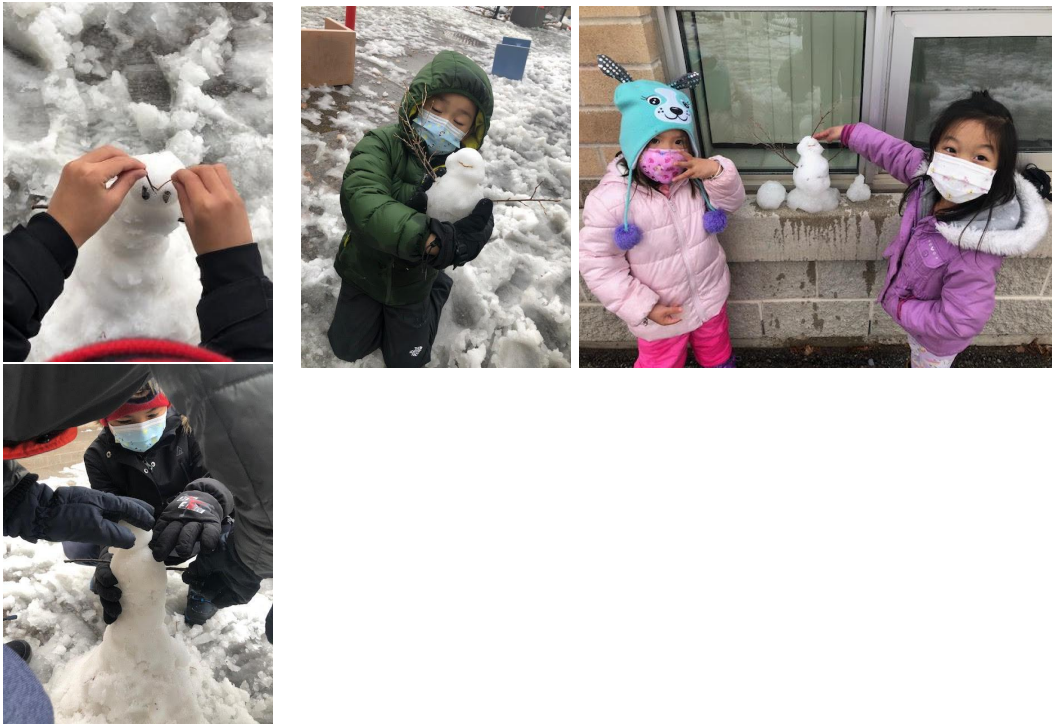
Within the **Physical Domain**, according to the Ministry resource document “*ELECT - How Does Learning Happen?*” children learned to augment their fine motor skills through use of tools like rubber bands and crafts sticks. (ELECT, page 54, 5.3)

Within the **Cognitive Domain**, according to the Ministry resource document “*ELECT - How Does Learning Happen?*” children learned to enhance their inquiry skills while observing and forming questions. They are able to collect and interpret information and compare their results with peers. (ELECT, page 59, 4.5)

## **BUILDING A SNOWMAN (OUTDOOR PLAY)**

Students were observed picking up the snow and discussing the consistency of different types of snow by picking it up, shaping, and handling it. Teachers enhanced the children's curiosity by researching the qualities of snow and learning about the differences between *packing snow* and *hoarfrost snow*.

They then enjoyed making shapes and snowmen with the snow and engaging in creative puppet shows and skits.



Within the **Physical Domain**, according to the Ministry resource document “*ELECT - How Does Learning Happen?*” children learned to augment their motor skills through use of shaping and molding. (ELECT, page 54, 5.3)

Within the **Social Domain**, according to the Ministry resource document “*ELECT - How Does Learning Happen?*” children learned to make connections and friendships through co-operative play in peer groups. (ELECT, page 57, 1.1, 1.3)

**Teacher:** “What type of snow do you think is better for building?”

**Student:** “Definitely packing snow because it’s heavier and sticks better.”

**Teacher:** “So do you guys think these will still be here tomorrow?”

**Student:** “If it’s hot, they will all melt!”

## CHRISTMAS CRAFTS

The children expressed an interest in making Christmas crafts and asked for materials. Teachers enhanced their interest by providing open ended materials and loose parts for the children to create their own crafts. Teachers also provided an open and blank bulletin board for the children to decorate and design a Christmas mural according to their own preferences and ideas.



**Teacher: "If I give you a blank board, what will you do with it?"**

**Student 1: "We're thinking of doing a winter themed mural."**

**Teacher: "So what did you decide to add?"**

**Student 2: "We will do different Christmas and winter art and characters to make it feel Christmasy."**

Within the **Social Domain**, according to the Ministry resource document "*ELECT - How Does Learning Happen?*" children learned to make connections and friendships through co-operative play in peer groups. (ELECT, page 57, 1.1, 1.3)

Within the **Physical Domain**, according to the Ministry resource document "*ELECT - How Does Learning Happen?*" children learned to augment their motor skills through use of shaping and molding. (ELECT, page 54, 5.3)

## UNDERSTANDING AERODYNAMICS



The children expressed interest in creating paper airplanes and testing them outdoors. Teachers enhanced their interest by suggesting we conduct research on the construction of airplanes and understanding aerodynamics.

Aerodynamics is the branch of physics that deals with the dynamics of air as it interacts with solid objects, such as airplane wings. Anything that flies, such as airplanes, helicopters, and birds, utilize the principles of aerodynamics to move through the air.

Airplanes are able to fly because of two key effects. The first effect is the "push" given by the airplane engines which propel the airplane through the air. The second effect is the movement of air over the airplane's wings which creates the lifting force required to keep the airplane up in the air. In simple terms, the wings of an airplane generate lift force and the engine creates the thrust to propel the airplane through the air.

Children altered the fundamental construction of their respective airplanes and tested them repeatedly while learning about wing force and air effects.

**Teacher: "What do you think you can do to make your airplanes go higher or farther?"**

**Student 1: "I'm going to make my wings a little thinner to see if that works."**

**Teacher: "What if we have a race and see how far our airplanes go?"**

**Student 2: "I already know mine will go farther because I already tested it."**

Within the **Social Domain**, according to the Ministry resource document "*ELECT - How Does Learning Happen?*" children learned to make connections and friendships through co-operative play in peer groups. (ELECT, page 57, 1.1, 1.3)

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