Science

6th Grade Summer Assignment

Popsicle Stick Catapult

A *catapult* is a ballistic device used to launch a projectile a great distance without the aid of gunpowder or other propellants. The word catapult used as a verb means to "hurl or shoot forward".

Students are to design a catapult using popsicle sticks, rubber bands, and a bottle top to "hurl" a projectile forward as far as possible. A table tennis ball (ping pong ball) will be used as the projectile.

MATERIALS:

- Popsicle sticks (the fun part is you can eat the popsicles and save the sticks)
- Rubber bands
- Glue dots, double sided tape, or glue
- Bottle top, for example milk bottle top.
- Table tennis balls (ping pong balls)
- Optional: sharpie marker to decorate table tennis balls
    - Other possible projectiles to try: nickel, pompom, marble

1. **RESEARCH** different designs for popsicle stick catapults.

2. **DESIGN** and draw a catapult.

3. **CREATE** catapult based on design.

4. **TEST** catapult to determine how far a table tennis ball can be launched. Record your data using metric measurements, by setting up a data table. Each catapult design should have 10 tests. (In science if data is repeatable it is believable).

5. **CHANGE** the design to try to launch further. **TRY** a different projectile that might go further.

In September submit

- The designs of your initial catapults
- All the catapults you built
- data table with measurements in centimeter or meters of the distance the projectiles went.
- The projectiles used to complete the activity.
- Assignment will be assessed as a homework assignment

HOW DOES A POPSICLE STICK CATAPULT WORK?

Newton's First Law states that an object stays at rest until a force is applied to the object.

When you pull down on the catapult arm, elastic potential energy is stored, when you release the catapult arm the potential energy changes to kinetic energy (energy of motion) which is transferred to the object which then flies through the air.

A popsicle catapult demonstrates energy being converted from one type to another (potential to kinetic) and transferred from one object to another (catapult arm to ball).

If you push the catapult arm down further you are storing more elastic potential energy which means more kinetic energy is transferred to the ball when you release it. The further you push the catapult arm down (which takes more force from you) the further the ball will travel.

7th Grade Summer Assignment
Build a Nest

The 7th Grade Science curriculum is Biology, or Life Sciences. Your summer assignment is to design and build a bird nest. Bird's build nests with no instruction, help, or GOOGLE, more importantly they build nests with no hands. A bird basically uses its beak to build a nest that will not fall apart in the wind or rain, and will safely support and protect its family.

RESEARCH birds and their nests. Some birds build their nests in bushes, or high in trees, some build their nests on the ground in sand, some build their nests on cliffs. Some birds build their nest in berry bushes with many branches which make for good nest sites and when the berries ripen they will give the birds a convenient food source. Go for a walk outside and look in the trees for bird nests. What are they made of?

Be careful not to disturb any nests you see outside.

DESIGN a bird nest, what it would be made of. What items are available to a bird to create its nest. Draw your nest. Then get curious, collect items and create.

MATERIALS: a tray or flat box to construct the nest on. Bucket to collect items. Twigs, sticks, leaves, vines, mud, sand, string. A small rock, plastic or ball to pretend as the egg(s).

This might begin to get messy. Try to do most of your work outside.

1. Using a bucket, collect items to begin to build your nest. Twigs, leaves, vines, pieces of string. What purpose could each item serve in building a nest. Remember the bird does not have a bucket to collect the nest building items in, the bird makes numerous trips collecting, then back to the nest site.

2. Now build a nest to safely hold at least one egg.

3. Test your nest as it is built. Pick it up, blow on it, will it stay together? Will it support the egg? Place a fan by it, what happens?

4. Build and design until the nest is stable and strong.

5. Clean up when the nest is complete. Dump left over items where you got them.

Save your nest to bring into school with you in September.

WRITE what you learned about building nests. In your own words, describe your discoveries: was it easy, difficult, time consuming. How well does your nest stay together, does it support the egg? Which materials worked the best? Does mudd work like glue in the construction? How difficult or easy was it to form the basket part of the nest? Do you think birds are natural born engineers?

The assignment will be assessed as a homework assignment.

8th Grade Summer Assignment
Periodic Table

Science

The 8th grade science curriculum is Physical Science. The curriculum encompasses chemistry and physics. Students will be studying the Periodic Table. To familiarize the students with the Periodic Table their assignment will be to complete the blank periodic table.

Students will complete the periodic table by filling in the"

- Atomic Number
- Atomic Symbol
- Name of Element

Element number one is completed. Element one is Hydrogen with an atomic symbol of H.

Each tile or square on the periodic table is for an Element. An element is matter composed of one type of atom. Every element has its own Atomic Number. The Atomic Number is the number of protons in the nucleus. The Atomic Number is written in the tile. The Atomic Symbol is the abbreviation for the element.

Students may use the internet for help. https://www.webelements.com/
Is a very helpful website to complete the assignment.

The assignment will be assessed as a homework assignment.