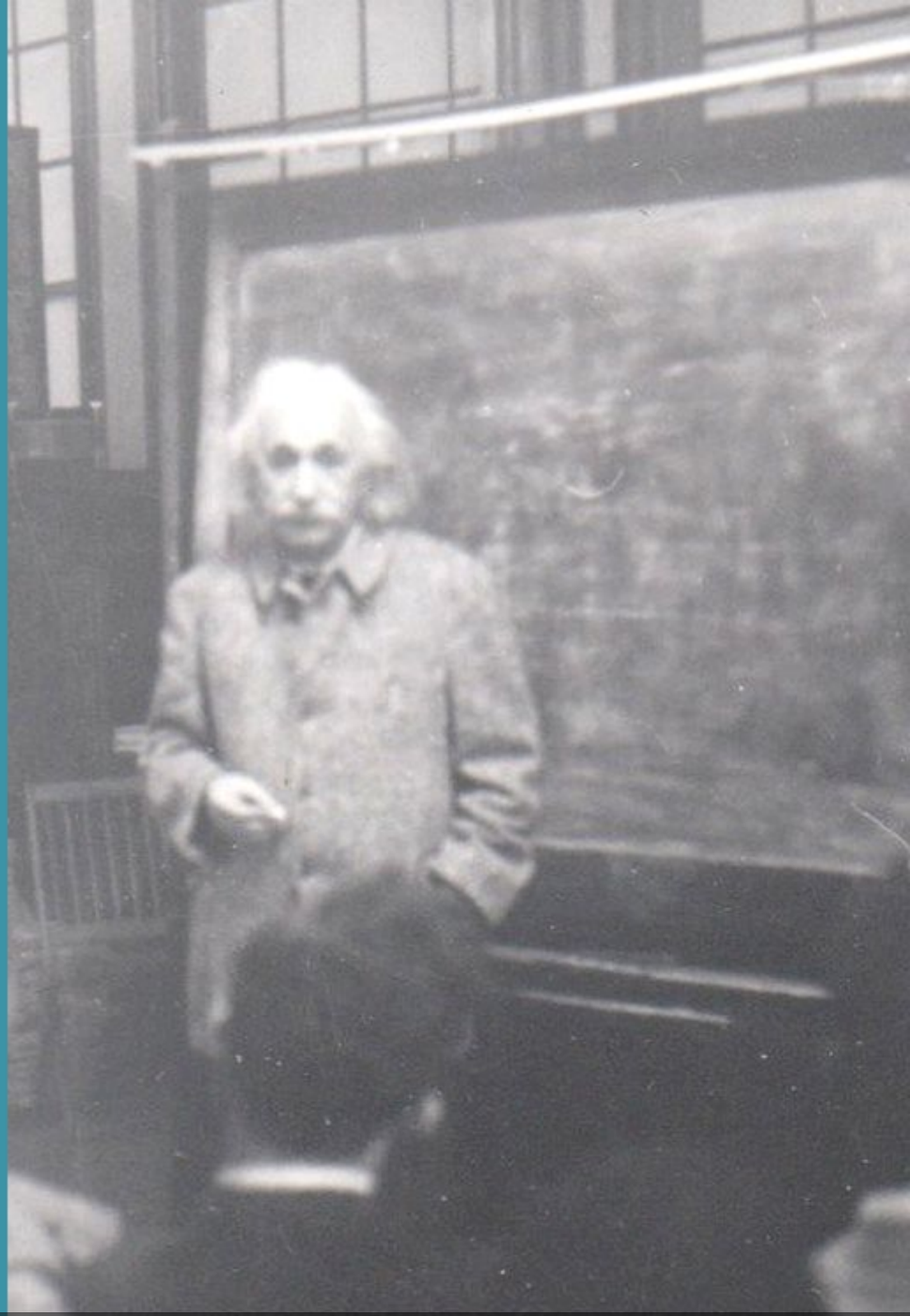
$$$ STORE

Explore The Possibilities

"The whole of science is nothing more than a refinement of everyday thinking."- Albert Einstein.



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WHAT IS $$$ STORE SCIENCE

IT IS...

1. Affordable
2. Promotes the 4 C's
3. Based on Questions & Inquiry
4. Fun

"The difference between screwing around and science is writing it down."

— Adam Savage

TODAY'S CHALLENGES

- Floating paper clips
- Spaghetti Towers
- Toothpick Cantilevers
- Foam Coasters
- Dancing Staples

MORE RESOURCES

- Pinterest
- MAKE
- Odyssey of the Mind
- Exploritorium/Lawerence Hall of Science

A BIG
thank you

Cantilever Structure

*A **cantilever** is a beam anchored at only one end. The beam carries the load to the support where it is forced against by a moment and shear stress.[1] Cantilever construction allows for overhanging structures without external bracing. Cantilevers can also be constructed with trusses or slabs.*

Materials
You will need 50 toothpicks and a 1inch x1inch piece of clay. You need a table on which a boundary line is taped across the top and a yardstick.

Problem
You are to build a structure of toothpicks and clay that will sit on a table behind a boundary line. The structure will cantilever, or stick out, as far as possible beyond the boundary line without touching the table surface.

You may break the toothpicks into smaller pieces if you wish.

If your structure touches the table surface, you must break it off until it is cantilevered.

You will be given 50 toothpicks and a piece of clay. The clay will be used to make the joints for your structure.

You may not press down so that the clay adheres to the table to support the cantilever.

Score yourself 1 point 1/4" the structure extends beyond the boundary line without touching the surface. See how far your structure can go past the boundary line!

Reflection
What is your interpretation of what happened?

What would you do differently?

How would go about doing that?

Try it Again

Tower of Pasta

Materials
Give each team 40 pieces of spaghetti, 15 pieces of elbow macaroni, 25 miniature marshmallows, 10 toothpicks, 4 straws, and 5 adhesive mailing labels. Have a table or desk available for the teams to build their structures. Give each team 5 pounds of 16-penny nails to use as weights, and a pint-sized plastic container.

The Problem:
You are to build a structure using the materials provided. The structure must be 8 inches tall, and freestanding. It needs to be able to support the container and additional weight.

The structure must rest on the surface of the table. It may not lean against a wall or be supported by anything else.

Once your structure is finished, you will place the container on top of it. It will then be measured from the surface of the table to the top of the container. It must measure at least 8 inches high to receive score.

Once your structure is measured, you will begin placing weights in the container one at a time. A weight must be held for 3 seconds to count for score.

You will be finished when your structure breaks, you have used all the weights, or time ends.

Reflection
What is your interpretation of what happened?

What would you do differently?

How would go about doing that?

Try it Again

Paper Tower

Materials
You will need 6 pieces of paper, 6 straws, 25 miniature marshmallows, 10 toothpicks, and 3 rubber bands. Have a table or desk available for the teams to build their structures. You will also need a measuring tape.

The Problem:
You are to build a structure of using the materials provided. The goal is to build the tallest freestanding tower.

The structure must rest on the surface of the table. It may not lean against a wall or be supported by anything else.

Once your structure is finished measure your structure using the tape measure

Reflection
What is your interpretation of what happened?

What would you do differently?

How would go about doing that?

Try it Again

Keep it Afloat

Materials
You will need 3x5 inch piece of aluminum foil, paper clips, bowl of water.

The Problem:
Make a metal boat that will support weight and stay afloat in a bowl of water.

Once your boat is floating, see how many paper clips it can hold.

Reflection
What is your interpretation of what happened?

What would you do differently?

How would go about doing that?

Try it Again

Foam Coaster

Materials
You will need4 feet of 1" foam pipe insulation cut in half (results in 2 4 feet “half pipes”), masking tape, marbles, a cup

The Problem:
Make a roller coaster that is at least 5 feet in length and includes a hill, a twist and a loop. The marble needs to be able to travel the roller coaster and land in the cup.

Using the materials provided develop a roller coaster that includes:

- A hill
- A twist
- A loop

At the end of the ride, the marble needs to end up in the cup.

Reflection
What is your interpretation of what happened?

What would you do differently?

How would go about doing that?

Try it Again