

Introduction to science learning & Smartivity- 10 minutes

Introduce yourself. Tell the children your name, your field of study, and a list of superlatives they must use when addressing you, such as _____

Who is a smart kid?

Gather answers from students and then tell them **the definition of a smart kid.**

What is smartivity?

What is science?

Science refers to a system of acquiring knowledge. This system uses observation and experimentation to describe and explain natural phenomena.

What is technology?

Technology is the application of science, or scientific knowledge for everyday use... or what we call practical purposes.

What is engineering?

Engineering is the branch of science and technology that deals with the design, building, and use of engines, machines, and structures...

What is mathematics?

Mathematics is not just about numbers and addition and subtraction and multiplication and division... Math and science go hand in hand. Math is a subject that helps us think about and experiment with science, technology and engineering concepts, before we actually build something.

What is STEM?

STEM is a shortform of Science, Technology, Engineering and Math... all the modern advances that we as humans have made is a result of these four subjects. These four subjects not only help us discover and invent new things, but also help us look at life in a different way - help us question why and why not... show us a way to find new solutions.

What is a Scientist?

"A scientist is a person who asks questions and tries different ways to answer them."

Then I show a PowerPoint I made, **What is a Scientist?**

Science in Life- 5 minutes

Science has invaded every branch of modern life. It is the noise of machines, cars, mills and factories, etc. which awakens us every-day in the morning. The food we eat, the clothes we wear, the books and papers we read, the recreations we enjoy, the games we play – all have something or other to do with the application of science.

Every person feels the effects of science in every sphere of life. It is not merely the electric light or the electric fan, the radio or the cinema that displays the power of science in our daily life, but everything we do or is done to us is in some way or another connected with science.

The things that we use in our daily life are mostly due to science. Our forefathers put on clothes woven by hand. Our clothes are made in large factories where scientific methods are used. We get so much paper to write on only because the paper mills can turn out huge quantities of it. Cloth and paper we had even before science came on the scene but no one could then think of the huge quantities in which they are produced now.

Science has conquered time and distance. We can travel from one place to another with a quickness which our forefathers could not have dreamt of. In the morning, we get news of events that happened yesterday in all parts of the world. Why should we talk of yesterday? With the help of the radio, we can listen to an American speaking. It would seem that he is before us and we are part of his audience. If we want to send a message to a person in America, we can send an email and he will get it in a few hours. If we want to speak to our friends far from us, there is the telephone that will connect us.

Effect of science on human life: It is, indeed, true that science has added tremendously to the comforts and conveniences of mankind. Unless one is an ascetic, one has no reason to reject the things science offers. By conquering time and distance science has brought mankind together and so far made life richer. By inventing medicines it has made our day-to-day existence relatively free from disease, and has, indeed, added to our length of life.

Examples of use of Science in everyday life: This fan and light works from the application of electricity. Electricity is one of the wonders of modern science. The bus which has an engine works with petroleum. The train is driven by the power of coal. This is possible only because of the application of science. My doctor gives certain injections and the patient soon well enough to come here. Medical science is another achievement of modern science, the marvel of medicine.

From the above, it is clear that science is playing an important part in our everyday life.

Scientists Stay Safe

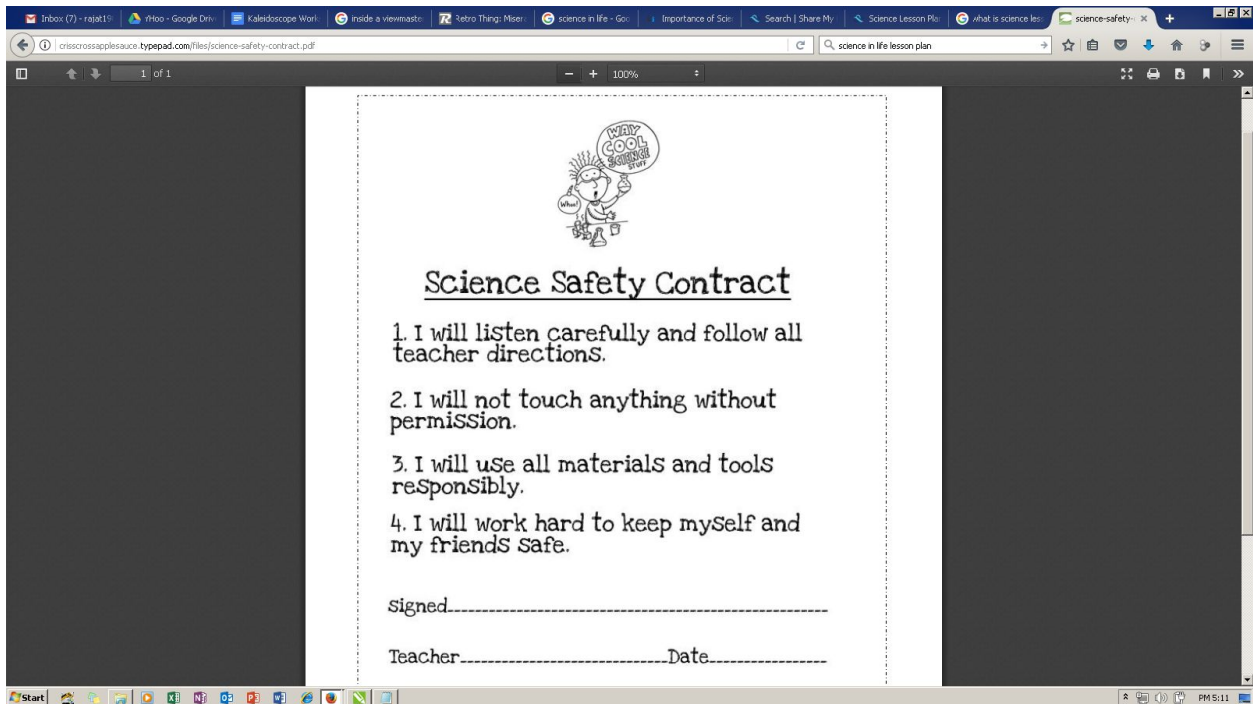
Today we take some time to go over all of the safety expectations in the [Science Safety Contract](#). I start by asking the kids "Why is it important for scientists stay safe? What kinds of things do scientists do to stay safe?"

We watch the PowerPoint [What is a Scientist?](#) again. I ask the kids to look for things that these scientists are doing to stay safe. (The chemist is wearing gloves and goggles; The geologist is wearing a hard hat; etc.)

Then I ask the kids about specific slides, for example-- "Do you think the volcanologist plays around with the hot lava? Do you think the chemist tastes the chemicals? Why not?"

We take a few minutes to discuss all the horrible catastrophes that could befall these scientists if they are not safe (the kids are very imaginative that way!) Then I tell the kids that, although we will not be near any volcanoes or tornados, it is still very important that **we** stay safe while doing science!

I hand out the [Science Safety contracts](#). We go over each expectation--one by one. We talk about why that expectation is important and what could happen if we didn't follow them. When we are done, we sign them and glue them in our notebooks!



Guide students to the scientific concept they will be learning through the activity which is

Reading Instruction Manual and identifying parts

(10 minutes)

Constructing the Kangaroo Ramp + Kangaroo - 150 minutes

Inclined Planes

Introduction Video: <https://www.youtube.com/watch?v=igrMlzHL-qg>

Introduce the Ramps:

http://www.peepandthebigwideworld.com/en/educators/curriculum/center-based-educators/ramps/activity/stand-alone/483/introduce-ramps/?node_context=

Ramps around Us:

http://www.peepandthebigwideworld.com/en/educators/curriculum/center-based-educators/ramps/activity/stand-alone/484/ramps-around-us/?node_context=

STEEP or STEEPER

Materials

- large marbles, small balls, or cardboard tubes for rolling (toilet paper or paper towel rolls)
- a number of identical ramps (cardboard, foam core, or wood—18" to 24")
- wooden building blocks (standard size) for propping up the ramps
- craft sticks or other objects for marking the distance the objects roll
- chalk or masking tape (for marking distance)
- camera or video camera

Key Science Concepts

- Rolling and sliding objects move faster and farther down steeper inclines.

Vocabulary

Encourage children to use words such as *incline*, *slope*, *slide*, *roll*, *steep*, *steeper*, *steepest*, *fast*, *faster*, *fastest*, *slow*, *slower*, *slowest*, and *farther*, as well as science process words such as *observe*, *compare*, *same*, *different*, *change*, and *predict*.

Directions

Note: Because you will be measuring the distance the ball or tube rolls, you will want to have enough space in front of the ramp for the rolling object to stop on its own. If you can build your ramps in a hallway or somewhere else with a long roll-out space, use balls, which will roll far and so work well with this exploration. If you have limited space, use paper towel tubes because they don't roll as far as balls.

1. With the children, build a ramp propped up with two blocks. Place a marble, ball, or tube at the top of the ramp and let it roll down. Mark where it stops.
2. Build a second ramp propped up on four blocks next to the first ramp. Ask children how the two ramps are different. Have them predict how far a ball sent down the steeper ramp will travel. Do they think that it will go as far as the previous ball did? Do they think that it will go farther? Why do they think so? Then send identical balls down the two ramps at the same time and mark how far each ball rolls.
3. Continue to build ramps of increasing steepness by propping them up on an increasing number of blocks. Each time, have children predict how far the ball or tube will roll. Try it out and mark the distance using chalk or masking tape.

Reflect and Share

Gather children back together to share their experiences and discoveries. Ask:

- *What did you notice about how the balls or tubes rolled down the different ramps?*
- *What did you do to get the balls (or tubes) to roll faster and farther?*
- *What did you do to get the balls (or tubes) to roll slower and less far?*

Extension

Challenge children to create an incline that will get the ball (or tube) to roll to a certain point on the floor or to roll into an open box or cup placed on its side at a specific spot.

ACTIVITY

Arrange your ramp at different heights. Roll one marble of 1 colour from a lower height and another marble of a different colour from an increased height. What do you observe? Does the second marble reach farther than the first marble? Why so?

Roll or Slide + Friction

http://www.peepandthebigwideworld.com/en/educators/curriculum/center-based-educators/ramps/activity/stand-alone/488/roll-or-slide-indoors/?node_context=

<https://www.youtube.com/watch?v=C7NPD9W0kro>

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Take “How do we Walk” section from Learner’s Log

ACTIVITY

Place a square block on the ramp. What happens?

Place a square block on a ramp covered with a slippery surface. What happens?

Place a ball on your ramp. What happens?

Place a broken marble on your ramp. What happens?

Slide and Lock mechanism - from Learner’s Log

Colouring a project - 20 minutes