3M Science. Applied to Life.™

3M Visiting Wizards

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genda (everybody's got one)

ntro
Background and evolution of 3M Visiting
izards • What kits are there?
Let’s DO a kit!
Deep thoughts
Other sciency 3M resources

What is 3M Visitin

Wizards?

- 3M scientists (and engineers, and even accountants) providing interesting educational demonstrations and hands-on
  experiments on a variety of science topics to K-5 classrooms and youth organizations to encourage young people to become *interested* in science and technology.

~~STEM~~ History

Eye chart

ne	Description	Science Topic(s)
l m	Pressure is generally the result of molecules, within gas or liquid, impacting on their surroundings. Experiment with everyday items that use air pressure and vacuum to understand how they work and why they are used. (this kit uses hand pumps for vacuum experiments – a bit more hands on)	Pressure, Bernoulli's principle, Vacuum

Air in Motion	Pressure is generally the result of molecules, within gas or liquid, impacting their surroundings. Experiment with everyday items that use air pressure and vacuum to understand how they work and why they are used. (this kit uses an electric pump for vacuum experiments – less hands on)	Pressure, principle,
Catapults	Catapults are used to take stationary objects (projectile) and hurl them towards a target without an explosive (rocket). Experiment with laws of motion and types of energy to affect the trajectory of an object.	Newton's motion, P Kinetic en
Color and Light	When we view an object, we are detecting light that originated at a light source, illuminated an object, and has been detected by our eyes. Experiment with light sources and filters to see how we can manipulate the color and light around us.	Reflectior Refractior Diffusion, Absorptio

Lab	The kit includes investigations of how a Crime scene specialist and scientists both use their skills of observation and identification to compare known properties to understand and explain unknown objects and events. Discuss finding solutions based on evidence and a logical and systematic approach.	Observation, evidence, scientific method
nics	Heat causes molecules to move faster (increase energy) and spread apart, while cold slows them down (decrease energy) and get closer together. Join us as we manipulate states of matter of materials and substances using liquid nitrogen.	States of Matter, Temperature
ion alysis	Scientists and engineers collect evidence, or data, to support explanations or theories about how things work. Experiment with different Hot Wheels cars to try and determine the factors that may lead to the "fastest" car available.	Velocity/Accelerati on, Forces, Scientific process
city mple s	The kit includes demonstrations of simple circuits, generators, parallel and series circuits, switches, including both mechanical and magnetic switches, simple electromagnets, and conductivity testing.	Electricity
dwater	The Groundwater kit explains the concept of percolation and filtration, and comprises hands-on demonstrations of how contaminates can enter and move into groundwater.	Water tables, aquifers, pollution and mitigation, filtration

Papermaking	Paper is all around us, and has a long history. This kit discusses the history, types, and uses of paper. The main activities of the kit are: 1) making a sheet of paper that the kids get to keep, 2) making a small piece of sandpaper (because 3M!), and 3) observing different types of paper and printing with handheld microscopes.	Pape Manu
Perception	This kit explores the concepts of human perception, how the brain perceives vision, and optical illusions.	Perce Persp Visua
Power of Numbers	This kit discusses collecting data and analyzing data. The first activity focuses on different ways to sort objects and making careful observations. In the second activity, cookies are weighed and then put into a histogram. Statistical concepts such as average can be discussed.	Colle of da
Science of Sound	This kit's investigations include exploration of the concepts of sound, how sound travels, and how humans experience it.	The soun perce
Search for Small	Experiments and activities will demonstrate that: 1. Objects can be observed and measured in different scales of size. 2. Materials can be classified by their properties (size, shape, color, etc.) 3. Materials function in nature and in manufactured goods by employing properties and strategies on a microscopic level	Obse micr
Simple Machines	The investigations include exploration of the concepts of work, force, friction, and gravity and their interplay in the six types of simple machines. Students experiment to see the concepts at work, and discuss where we find them in the world.	Work gravi
Toys in Space	Experiment with some common kids' toys. Make hypotheses about whether they would act the same in zero gravity, then watch video of astronauts playing with the same toys on their missions!	Gravi
Wind Energy	Experiment with different configurations of wind turbine blades to see which creates the most energy output.	Wind expe

ame	**Description**	**Science Topic(s)**
c of ce	Three experiments showcase some phenomena that seem like magic, but can be explained by science. Understand that science and magic require careful observation and critical thinking. Learn that the scientific process and creative thinking guide investigations (process) and that science can help us to better understand the world around us (application)	Material science, magnetism
nets	Students explore the concepts of attraction and repulsion, magnetic fields, magnetic poles, and electromagnets.	Magnetism, Electromagnetism

Let's do a couple of kits

Air and Vacuum
and
Air in Motion

My approach

- Fun!
- Lots of interaction, asking questions
- Hands-on (as much as possible)
- Relate to real world

Keep it age-appropriate (but I'm sometimes surprised)

You don't have to be a scientist to do science • STEM

sn't for everyone, but don't assume it's not for you •

Keep a sense of wonder

• Don't be afraid

3M Science Outreach

grams• **STEP:** *3M provides a learning and science-based work*
nce to junior and senior high school students who show an interest in a
ic career (currently just SPPS). (1972)

CH: *3M scientists visiting 6-12 classrooms to encourage*
entary, junior and senior high school students, especially young
en and minorities, to consider careers in science and
eering. (1979)

ST: *3M provides a summer work experience for math and*

ce high school teachers to work side-by-side with researchers in abs. By providing a challenging, technical experience in an industrial g, we can reach students through their teachers. (1984)

ting Wizards: *3M scientists providing interesting ational demonstrations and hands-on experiments on a variety ience topics to K-5 classrooms and youth organizations to urage young people to become interested in science and nology. (1985)*

eb resources

Visiting Wizards:

- https://www.3m.com/3M/en_US/company-us/visitingwizards/ - register to able to request free VW visits
- 3MWizards@mmm.com – general info, help with registering

Broad overview of 3M Community initiatives, with links: •

https://www.3m.com/3M/en_US/people-community/our-communities/

Science at Home – videos of short experiments

- https://go.3m.com/3M-science-at-home

3M Science Teacher Workshop

Friday, October 2nd

3:00-5:30pm

3M Center, Maplewood (tall building on I-94) •

Showcase of 3M and other community STEM

esources • Lots of free 3M stuff!!!