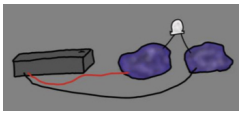
Volume 26 No. 2 November/December 2017

GO4ST8 PHYSICS
physics education in minnesota

November 11, 2017 10:00 AM – 12:00 PM

Rivers Edge Convention Center – St. Cloud, Minnesota
The November meeting is part of MnSTA COSE

Electrical circuits are the foundation of our modern, technology-driven lives. Everything from simple light bulbs to complex devices like the iPhone depend on electrical circuits in order to function. The basic structure of each of these devices is the same: there is a power source, which is connected to some wires, which are connected to a device that uses the power to do something useful (like lighting up a room, or displaying a Facebook message from your friend). The main point of this hands-on session is that you don't need to be an electrical engineer to get some hands-on experience with circuits. You don't need to use a soldering iron or a prototyping board or circuit diagrams in order to start learning about electricity. In fact, all you need is some playdough to start building your own circuits. This non-traditional circuit technology is a fun way to introduce students to circuit design with a toy that is familiar, safe, and easy to manipulate. Participants will use readily available materials such as AA battery packs, LEDs plus conducting and non-conducting dough to construct various circuits. Also materials provided by www.SquishyCircuits.com will be used.



GO4ST8 PHYSICS Schedule
Second Saturday – Odd Months – Minnetonka High School

The GO4ST8 Physics Committee recently met and scheduled meetings for the 2016/2017-year. Those and other meetings scheduled

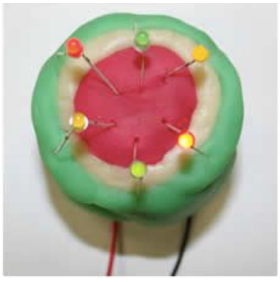
September 9, 2017	Minnetonka High School	GO4ST8 Physics
November 11, 2017	St. Cloud Rivers Edge Convention Center	MnSTA/GO4ST8 Physics
January 13, 2018	Minnetonka High School	GO4ST8 Physics
March 10, 2018	Minnetonka High School	GO4ST8 Physics
April 11, 2018	Minneapolis – Target Field	Physics Day at Twins Baseball (Houston Astros)
May 2, 2018	Minneapolis – Target Field	Physics Day at Twins Baseball (Toronto Blue Jays)
May 5, 2018	Valleyfair Amusement Park	App worhshop (9 am – noon)
May 21, 22, & 23, 2018	Valleyfair Amusement Park	Physics Day at Valleyfair

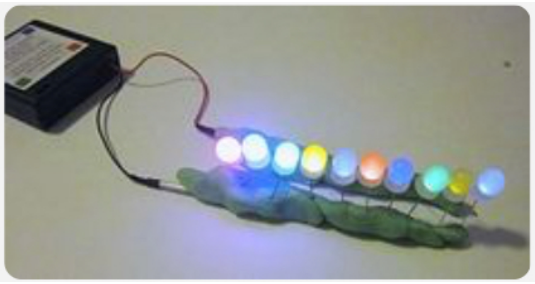
The Saturday GO4ST8 Physics meetings are normally held from 9:00 AM – 12:00 PM. As always these meetings are open to anyone who has an interest in physics. There are no fees outside of a willingness to participate. The meetings consist of make, take, and do, sharing, special topics, guest speakers depending on the date.

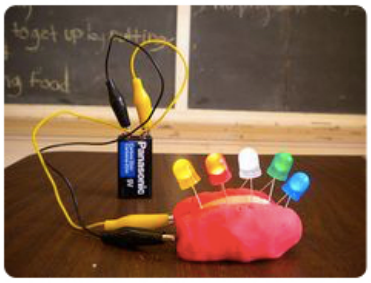
Minnetonka High School - 18301 Highway 7, Minnetonka, MN 55345 (Do a web search to get directions from your site) Participants should enter the east side entrance, door labeled 14 E	GPS coordinates: N 44 deg 54.540 min W 93 deg 30.599 min

AnnMarie Thomas: Hands-on science with squishy circuits

In a zippy demo at TED U, AnnMarie Thomas shows how two different kinds of homemade play dough can be used to demonstrate electrical properties -- by lighting up LEDs, spinning motors, and turning little kids into circuit designers; check it out!
http://www.ted.com/talks/annmarie_thomas_squishy_circuits







MnSTA Conference on Science Education
November 10-11, 2017 • St. Cloud, MN

Our event starts Friday morning at the Rivers Edge Center. We'll have a day full of great sessions for educators. We welcome U of MN professor Dr. Jim Kakalios for our keynote. In addition, each conference strand will include a special strand speaker - bringing expertise in each strand topic. Go to www.mnsta.org for more information.

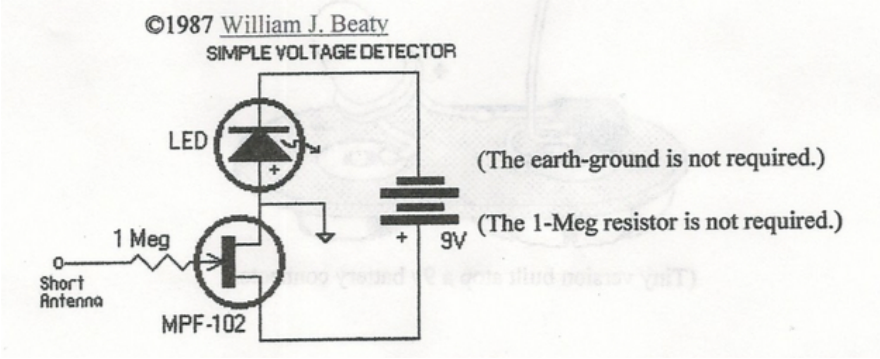
MnCOSE17 Pre-Conference Grid : PreConference Grid

Strand	Room	Session I 8:00 - 8:45 AM	Session II 9:05 - 9:50 AM	Session III 10:10 - 10:55 AM	Session IV 1:30 - 2:15 PM	Session V 2:35 - 3:20 PM	Session VI 3:40 - 4:25
Physics	Schilplin Room	**Physics Strand Speaker** *Dr. Kevin Haglin, St. Cloud State University*	An Overview of Modeling Instruction: *Scot Hovan, St. Paul Academy & Marta Stoeckel-Rogers, Tartan High School*		Rainbow on a Paper: *Steve Lindaas, Trevor Harder & Isaac Skalsky, Minnesota State University Moorhead*	Shocking Demos: *Steve Lindaas & Isaac Skalsky, Minnesota State University Moorhead*	Why am I making this graph?: Helping students understand th importance of graphs: *Jason Hall, Academy Angels*
Physics	Whitney Room		Bridge UP! - Using bridge design and construction as a gateway to STEM: *Nicole Bartelt, Minnesota Department of Transportation*	Teaching Science with a Murder Mystery: *Joe Cossette, Minnetonka High School*	Keeping the "S" in STEM with Evidence-Based Reasoning: *Marta Stoeckel-Rogers, Tartan High School*	Rocket Science Revisited: *Tom Tomashek, Minnetonka High School*	The Dixie Cup Cell Phone Speaker: *Tom Tomashek, Minnetonk High School*

GO4ST8 Physics – January 13, 2018 – Minnetonka High School – Renewable Energy
Mike Maas is organizing this meeting; if you have ideas or activities to share contact Mike Maas at Eden Prairie High School.

Valleyfair Physics Days – May 21 – 23, 2018 – Milk Carton Boat Races
Now is a good time to start thinking about the Valleyfair Milk Carton Boat Races; start by collecting milk cartons and plastic milk containers. Go to < https://www.valleyfair.com/explore/groups/student-and-youth/physics-and-science-days> for more information.

RIDICULOUSLY SENSITIVE ELECTRIC CHARGE DETECTOR

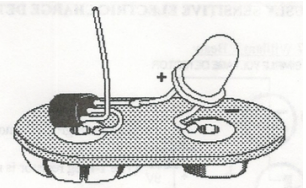


This simple circuit can detect the invisible fields of voltage which surround all electrified objects. It acts as an electronic "electroscope."

Regular foil-leaf electroscopes deal with electrostatic potentials in the range of many hundreds or thousands of volts. The above device can detect one volt. Its sensitivity is very high! Since "static electricity" in our environment is actually a matter of high voltage, this device can sense those high-voltage electrically charged objects at a great distance. On a low humidity day and with a ½ meter antenna wire, its LED light will respond strongly when someone combs their hair at a distance of 5ive meters or more. If a metal object is lifted up upon a non-conductive support and touched against the sensor wire, the sensor can detect whether the object has an electrostatic potential of as little as one volt!

PARTS LIST:

- 1 - Standard 9-volt battery
- 1 - MPF-102 N-channel Field Effect Transistor (FET) Radio Shack #276-2062
- 1 - any Red Light Emitting Diode (LED), e.g. Radio Shack #276-041
- MISC:
  - Battery connector (#270-325)
  - Alligator Clip Leads (#278-1156)
  - solder, if desired
  - 1-meg resistor (not required)
  - plastic, fur, foil, comb, tape dispenser, plastic cup



(Tiny version built atop a 9v battery connector)

Construction Hints

Warning: do not connect the battery until you are sure you have connected everything else exzctly right; it is possible to burn out the FET or the LED if connected incorrectly. Do not let the transistor's wires to bump together even briefly, it might flash the LED and burn it out.

Warning: Avoid touching the Gate wire of the FET, any small spark jumping from your finger to the Gate wire can damage the transistor internally.

Make sure LED is connected properly.

To test the circuit, electrify a pen or a comb on your hair, and then wave it close to the little "antenna" wire. Thw LED should go dark. When you renove the electrified pen or comb, the LED should light up again.

Who/What is GO4ST8 Physics?

GO4ST8 Physics is an organization developed over twenty years ago by physics teachers for persons interested in physics education in the state of Minnesota. There are no dues just an interest in sharing ideas that can improve physics education and the persons attending the meetings. There are usually 4 meetings a year; we have had people attend who live in northern Iowa or northern Minnesota; we try to accommodate these participants by scheduling meetings from 9:00 AM – 12:00 PM on Saturdays. It is usually easier to attend a meeting on a Saturday morning versus during weekdays. An important part of the meetings is the networking that is developed. Participants gain because of the variety of expertise of all the participants.

The newsletter that is sent to describe particular meetings usually contains information that can be used in the classroom; The ideas or make and takes give an idea of some of the sharing that goes on at the meetings and is for persons who live too far away to attend meetings.

Participants are always welcomed and are encouraged to bring others with them.

Steve Ethen
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Burnsville, MN 55337

sethen@umn.edu

_____ Please add my name/address to the mailing list

_____ Please edit my name/address

_____ I am not interested in attending GO4ST8 Physics meetings or being on the mailing list. Please remove my name/address from the mailing list.

_____ I have an idea that I would like to share that I have enclosed or an idea for a meeting.

Name _____
First name last name

School _____

Address _____

City _____ State ____ Zip _____

e-mail address _____

The above information can be sent to Steve Ethen via snail mail or e-mail at the addresses given above.