Engaging 21st Century Learners using Plickers, Podcasts, and PASCO Sensors

Association of Science Teachers (AST)
October 29, 2023

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COMPUTER LOGIN: You can log in using GNSPES

GOALS FOR TODAY'S WORKSHOP

We're going to figure out practical tools to help engage learners in our classrooms:

01 **Plickers:** Interactive formative assessment tool (free)
Target Audience: Elementary, Early and Late Secondary School

02 **Podcasts:** Using handhelds to record activities to support additional learning
Target Audience: Early, Mid, and Late Secondary School

03 **PASCO Sensors:** Temperature probes, weather sensors, and motion sensors
Target Audience: Mid and Late Secondary School (Can Be Used for Elementary)

04 **Crayon Physics**
Target Audience: Elementary, Early and Late Secondary School

There will be moments where we can explore and play

A LITTLE ABOUT ME

Career Information

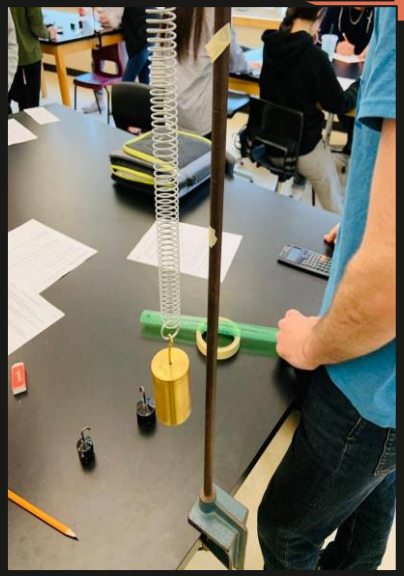
- 14** years teaching in the Halifax Regional Centre for Education (HRCE).
- Primarily teaching Physics 11 and 12, and the IB Physics Curriculum.
- Presenter for AST for 3 Years (Online and in-person)
- Presently working at StFX as a Research Analyst (short-term appointment)

Education

- Inter-University Ph.D. program in Education at St. Francis Xavier University (Year 1).

  Dissertation Working Title:
  The ideology of success for African and Black Nova Scotian students in high school sciences.

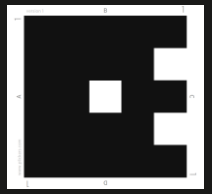
- Master of Education in Educational Leadership and Administration (StFX; 2017)
- Master of Education in Curriculum and Instruction (StFX; 2014)
- Bachelor of Science in Physics and Mathematics (DAL; 2007)



Instructions for Using plickers

Please do not bend or mark on these Plicker Cards!

Do not share the card # to people nearby ☺



READY TO PLAY?

Tools Needed

- Computer (Internet and Projector)
- Smartphone with Internet
- Plicker Cards
- Question Bank for Your Class

Ideas to Support Learning

1. **Not assigning names to the number on the card:** It encourages all students to take part without risk of being “outed” for incorrect responses. You can randomize the cards each time. Or, you can tell them to hide their card numbers forever.

2. **If you choose to assign names to numbers:** You can have the formative assessments recorded on the Plickers system.

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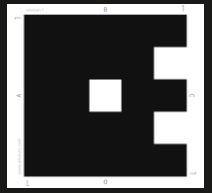


All our printable card options

We offer free cards in a range of formats:

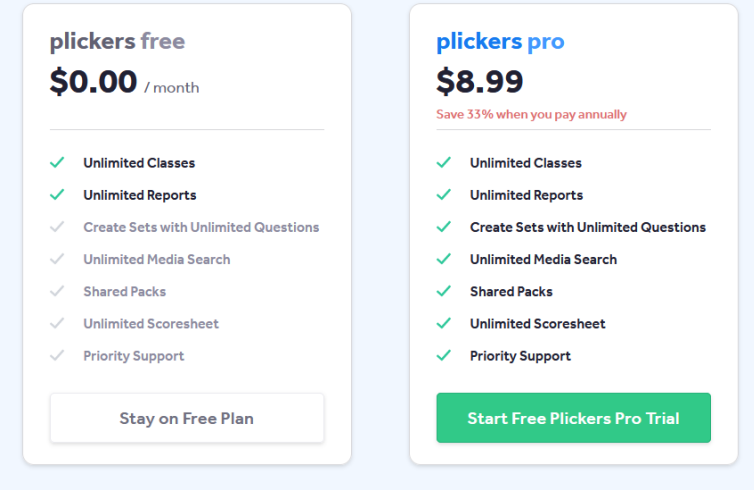
Standard - for a set of 40 cards, click here

Expanded - for a set of 63 cards, click here

Large Font - for a set of 40 cards, designed for those who prefer larger lettering, click here

Jumbo - for a set of 63 oversized cards (one per page), click here

I highly recommend just printing them on cardstock via photocopier (cheaper)



Podcasts for Supporting Learning

Review Learning | Pre- and Post- Activities | Engagement with Families

Review of Major Concepts

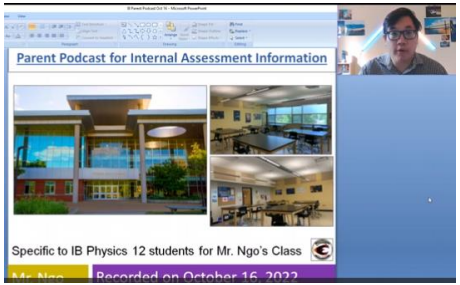
You can do a video recording of major examples done in class. That way, students who miss class or require review have another avenue to review.

Pre- or Post-Lab Activities

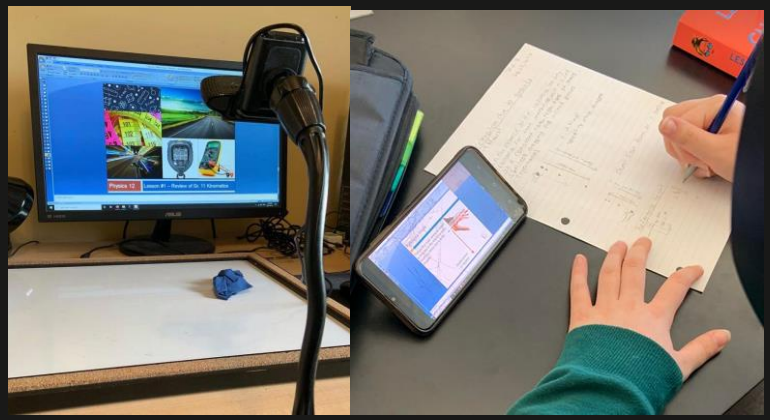
In my case, instead of repeating instructions on how to graph using Google Sheets, I recorded step-by-step instruction videos to help guide students. It helps develop self-learning and independence.

Sharing Video Messages to Parents and Guardians

I use it to convey important information to parents and guardians. That way, they are informed of certain classroom events and practices.



HOW YOU CAN ADAPT IT?



Equipment Used: Logitech C922 Pro Webcam. You can use others but for the purposes of this presentation, I'll be sharing my experiences using Logitech equipment. A 'streamer' webcam is highly advised.

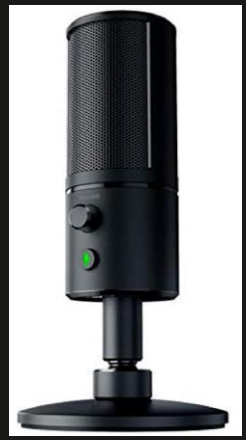
Record an example with solutions using your device:
Then, upload it on Google Classroom. The students take time to attempt the problem while you walk around and engage with students.

Provide lab instructions and have students watch it:
Reduces the number of times you have to repeat instructions.

Have students make a multimedia presentation:
An alternative way to express student learning.

Short video messages to parents and guardians:
Shifts the responsibility for families to stay up-to-date.

TOOLS I USE FOR MY PODCASTS:



Recommendation #1: Ensure your Webcam Has “Camera Stand Threads”
What you are seeing is a “Smatree Adjustable Jaws Flex Clamp Mount with 13.4" Gooseneck Extension.” It allows me to clamp the Webcam to my desk when recording video focused on the desk whiteboard or notes on paper

Recommendation #2: Buying a Dedicated Microphone with Diffuser
This will ensure higher sound quality in your videos. Last year I bought this and all my videos have a much more professional feel to it. Buy it on sale (usually during the holidays)

QUESTIONS SO FAR?

I will post this content via my website:

QR Code for the Resource Folder to Today's Presentation

http://www.ayva.ca/sci/novascotia/

PASCO SENSOR ACTIVITIES

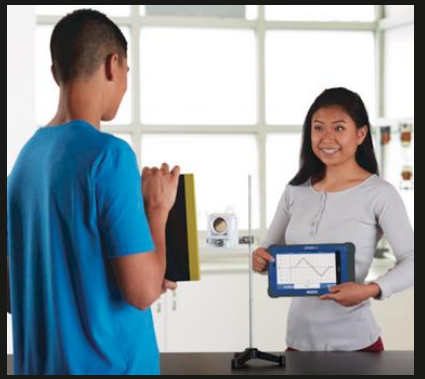
These activities are geared for Grade 8-12 (Mid- and Upper-Secondary)

TEMPERATURE PROBE

Specific Heat Capacity Lab (Graphing)

WEATHER STATION SENSOR

Weather Forecasting Activities (Environment)



MOTION SENSOR

Physics or Motion Activities (Graphing)

Images from PASCO Web Site

http://www.ayva.ca/sci/novascotia/

EXPLORING THE TEMPERATURE PROBE

There are many pre-made lab activities (English and French) on the web site!

ACTIVITY: Take a peek online on the web site; we will navigate to see the resources. We can also interface with our devices as well.

Images from PASCO Web Site

http://www.ayva.ca/sci/novascotia/

EXPLORING THE WEATHER STATION

There are many pre-made lab activities (English and French) on the web site!

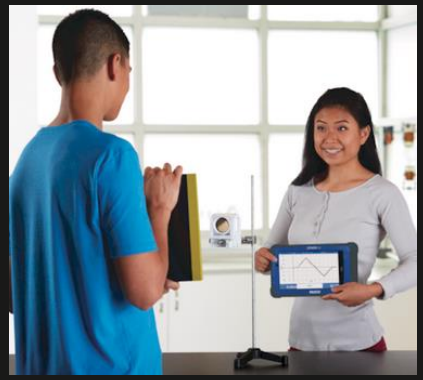
ACTIVITY: We are going to turn on the weather station, interface it with our devices, and then see what options it has for us. I will also show you how to remote log this device so that you can collect data over a day without being present. Then, offload that data for your students to see ☺

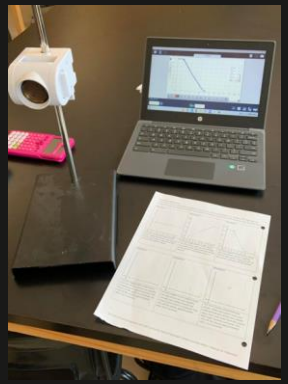
Images from PASCO Web Site

https://www.pasco.com/products/software/matchgraph

EXPLORING THE MOTION SENSOR

There are many pre-made lab activities (English and French) on the web site!





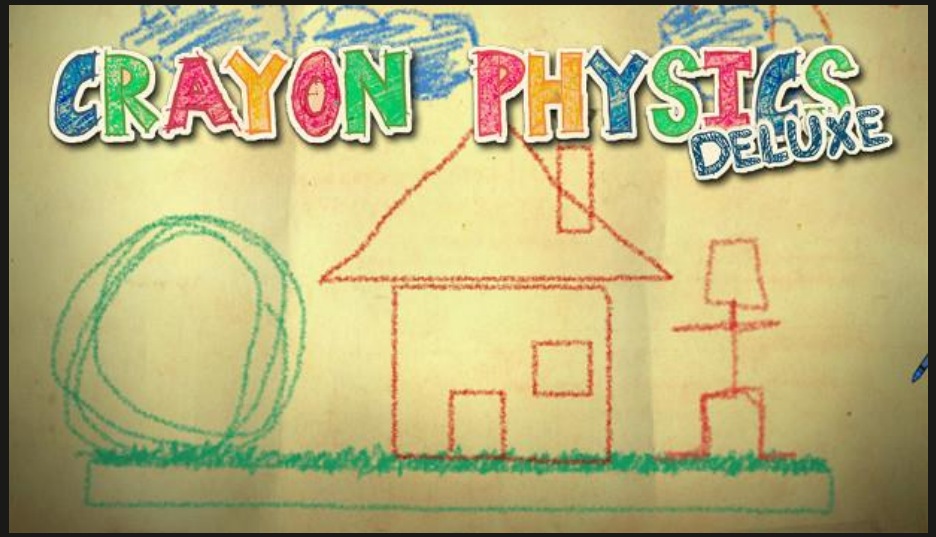
ACTIVITY: Be prepared to move around for this activity. I use this activity to anchor students understanding of graphs prior to teaching them motion graphs in Science 10.

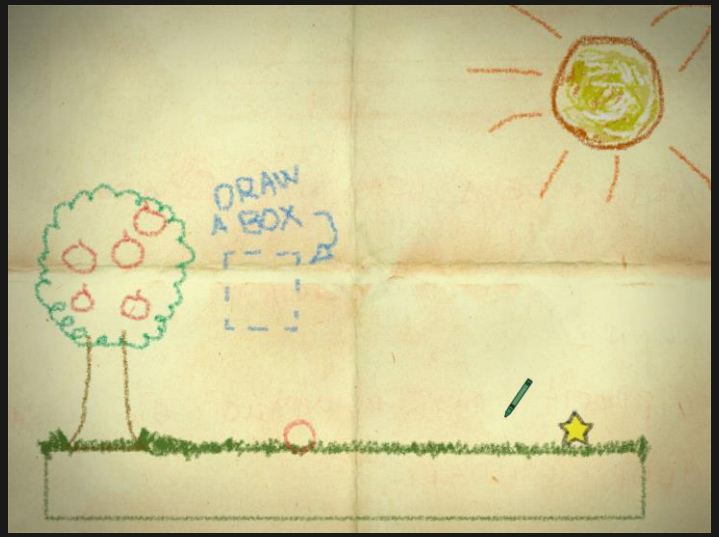
Images from PASCO Web Site

http://www.crayonphysics.com/

CRAYON PHYSICS

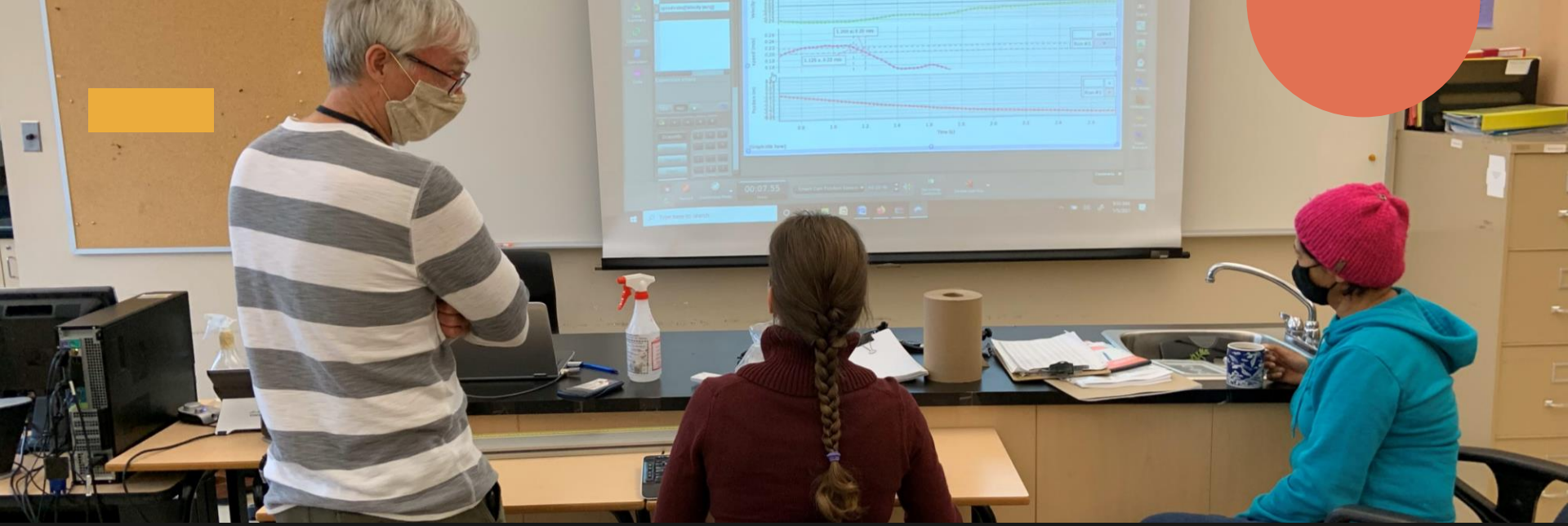
These activities are geared for Upper Elementary and All Secondary





The objective of the game is to draw Newtonian objects to get a ball to a star. Most useful for solving complex problems visually. You can build levers, pulleys, ropes, and ramps (and more) to solve an objective. You can have students draw on the whiteboard for ideas to solve problems.

Best used with a wireless mouse | Even better if you use a Mimio or Smartboard



Final Thoughts and Reflections

I recognize that we only have one provincial PD day a year. But hopefully I offered something of value.

I also recognize that we, as a profession, do very powerful things and are often under appreciated. Being away and looking in, I often see incredible educators do terrific work daily. I wish to recognize that fact.

Photo: Several of my colleagues and I learning how to use PASCO sensors during the 2021-22 School Year

IT'S SO LOVELY TO MEET ALL OF YOU!

Thank you for listening.
Feel free to reach out at mngo@hrce.ca

Hope you have a great PD Day!