Welcome! We'll start at half-past the hour.

PASCO

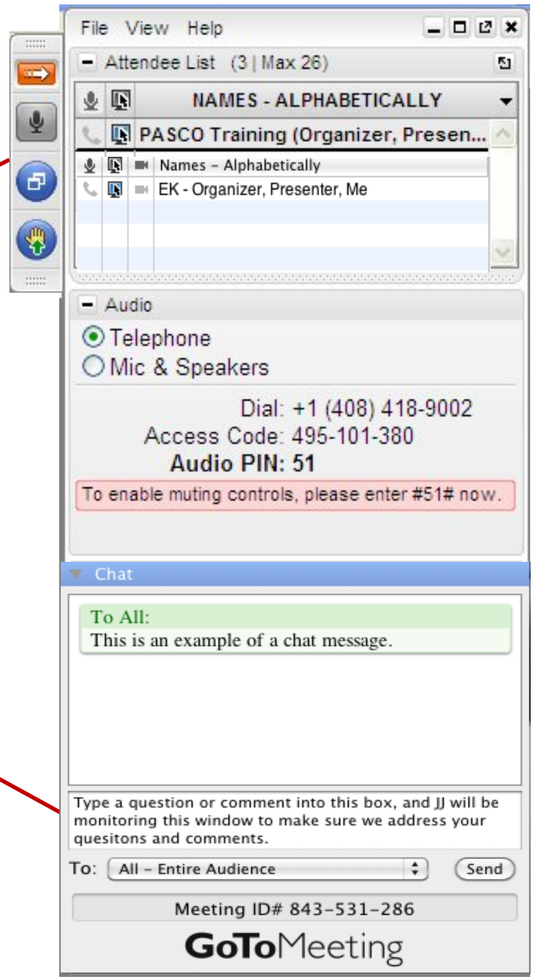
Coding in Science: Activities for Hour of Code

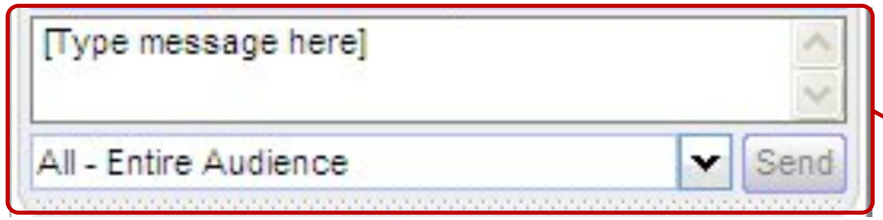
Housekeeping

Your mic is muted.

GoToTraining Chat

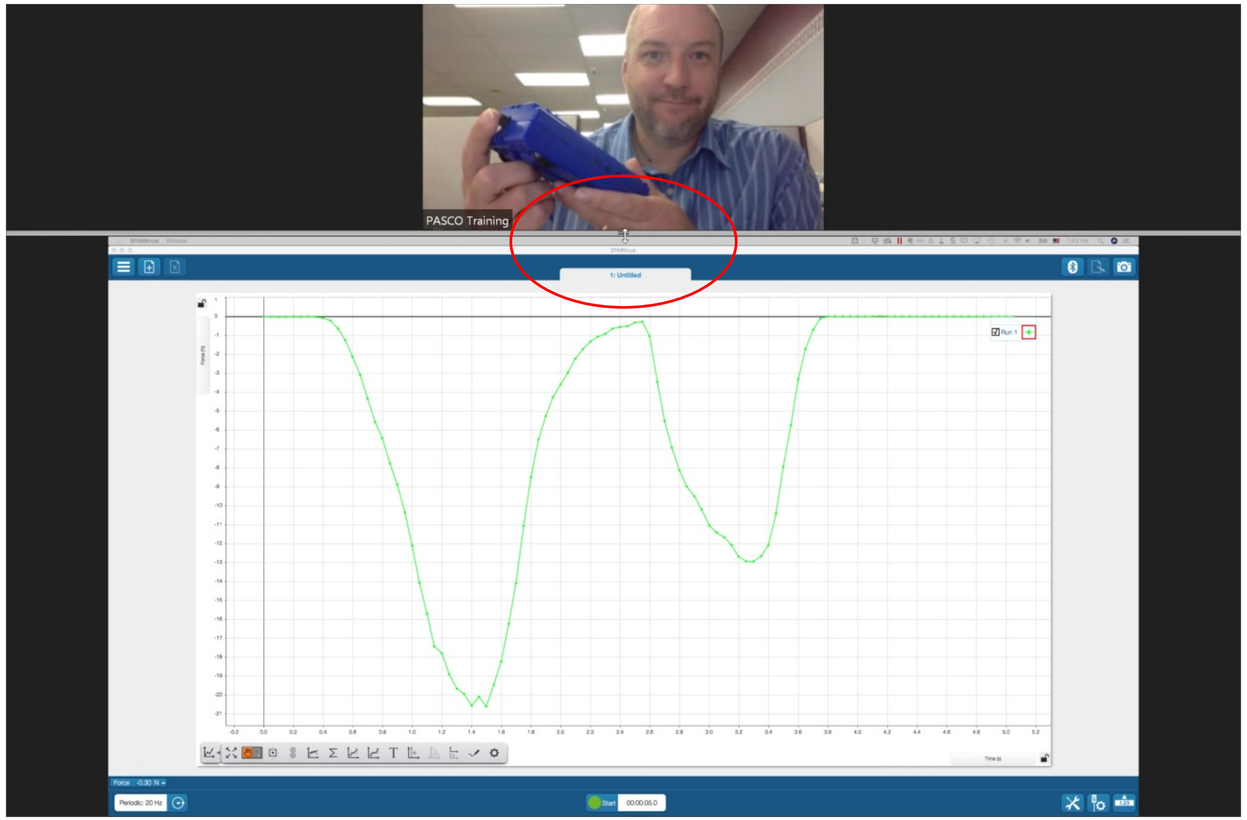
Try It Now:
Send a chat to All letting us know where you're joining from.





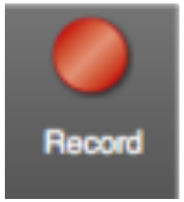
Send Chats To:
→All – Entire Audience *or*
→Organizer(s) Only

Live Video & Screen Sharing

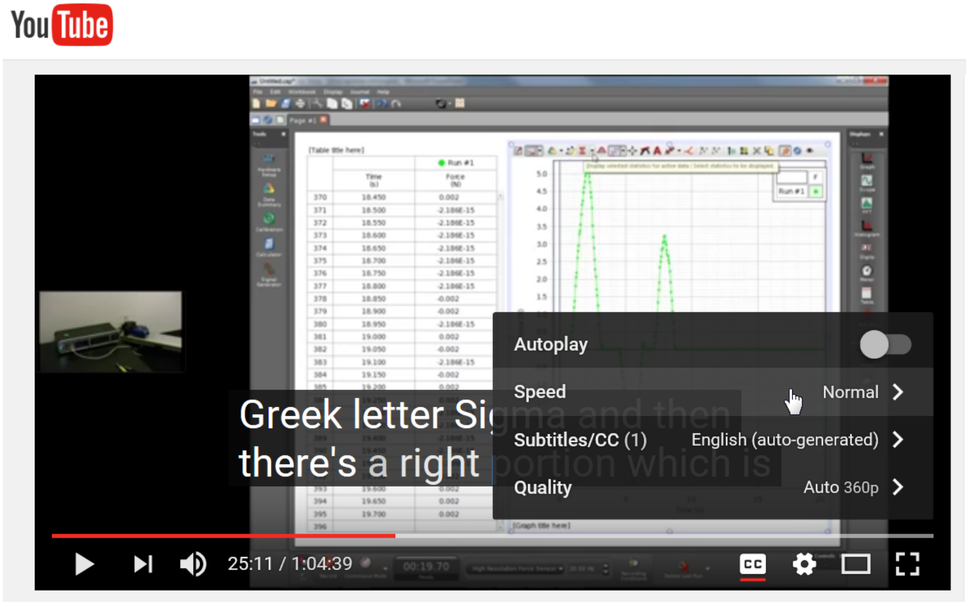


When live video is being shared, you have control of the relative size of the video and shared screen (live session only).

Session Recording



You'll receive a link to the session recording by email tomorrow.

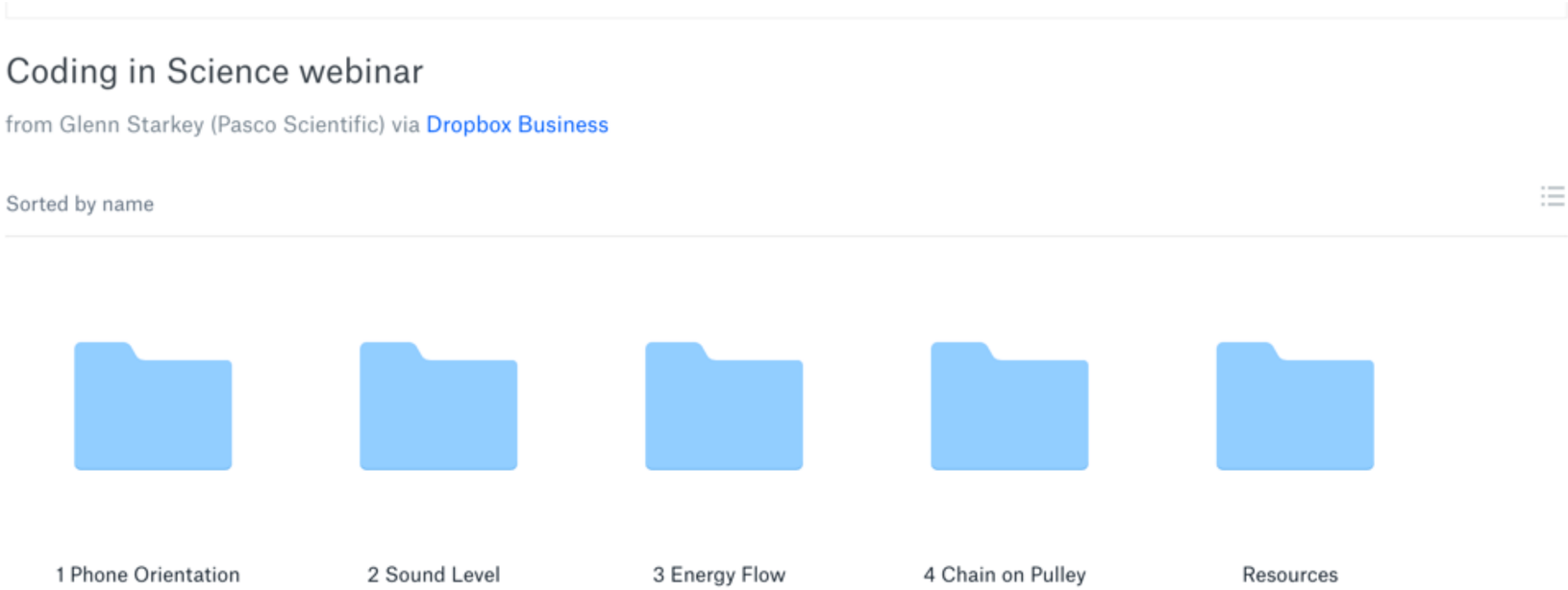


YouTube

- variable speed playback
- English captions (auto)
- translated captions (auto)
- Unlisted, but link is shareable
- *see YouTube description for links to start of each of today's four activities*

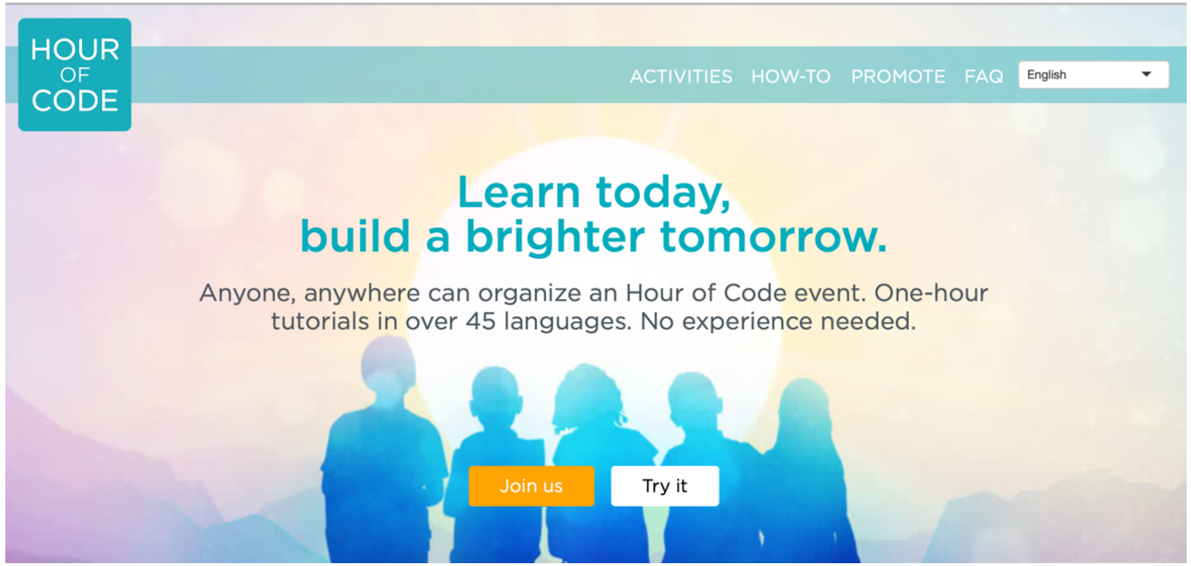
Session Files

https://bit.ly/codinginscience



Hour of Code

https://hourofcode.com



What is the Hour of Code?

The Hour of Code started as a one-hour introduction to computer science, designed to demystify "code", to show that anybody can learn the basics, and to broaden participation in the field of computer science. It has since become a worldwide effort to celebrate computer science, starting with 1-hour coding activities but expanding to all sorts of community efforts.

Poll

What’s your experience level with coding?

Your Facilitators

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PASCO Curriculum and Professional Development

Today's Activities

presenter	topic	key equipment	software	features
	phone orientation	phone	SPARKvue	Blockly basics: sensor input, text output, program flow
	sound levels	//code.Node	SPARKvue	compound conditionals, physical outputs
	energy flow	temperature sensor	SPARKvue	variables, time, math operations, text & number outputs, lists
	chain on pulley	rotary motion sensor or photogate and pulley	PASCO Capstone	math model output & comparison to measurements

PASCO Software with Blockly Coding

SPARKvue

licenses (and free trial) available for
Windows and macOS
free app for iOS, Android, and Chrome OS

data collection and analysis for all sciences, elementary school through early university

PASCO capstone™

licenses (and free trial) available for
Windows and macOS

data collection and analysis especially for physics and engineering, upper high school through upper university

includes Blockly coding for controlling outputs based on sensor inputs

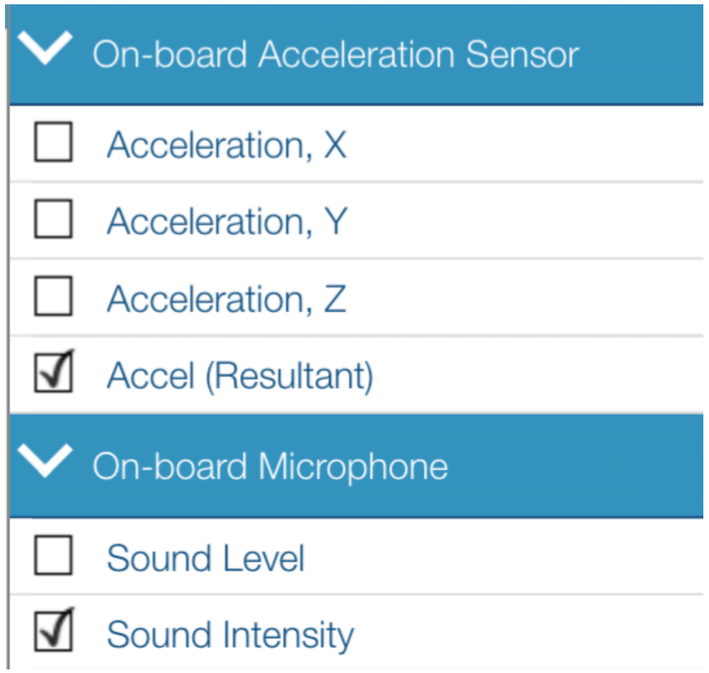
software comparison: https://www.pasco.com/products/guides/software-comparison

Activity 1: Phone Orientation

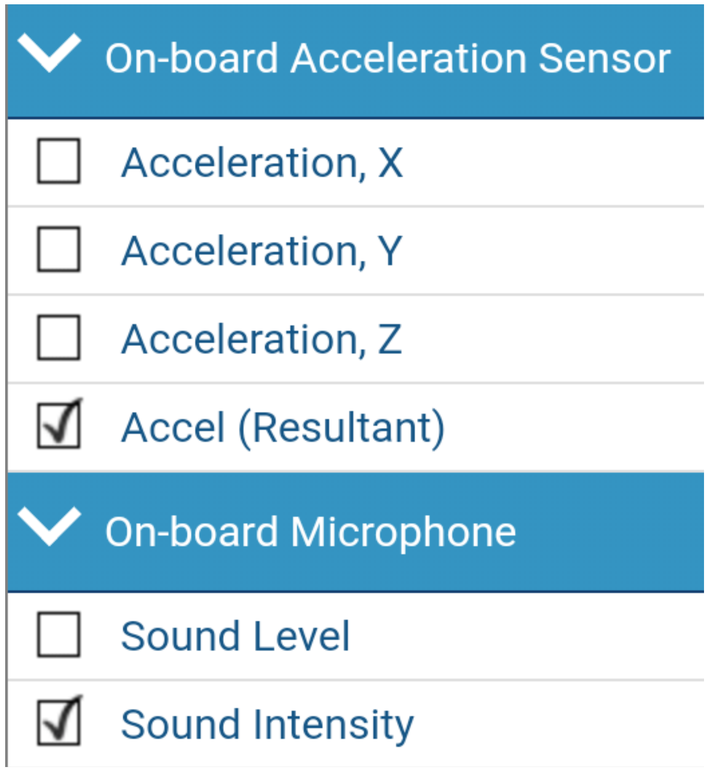
aka: Turn that Frown Upside Down

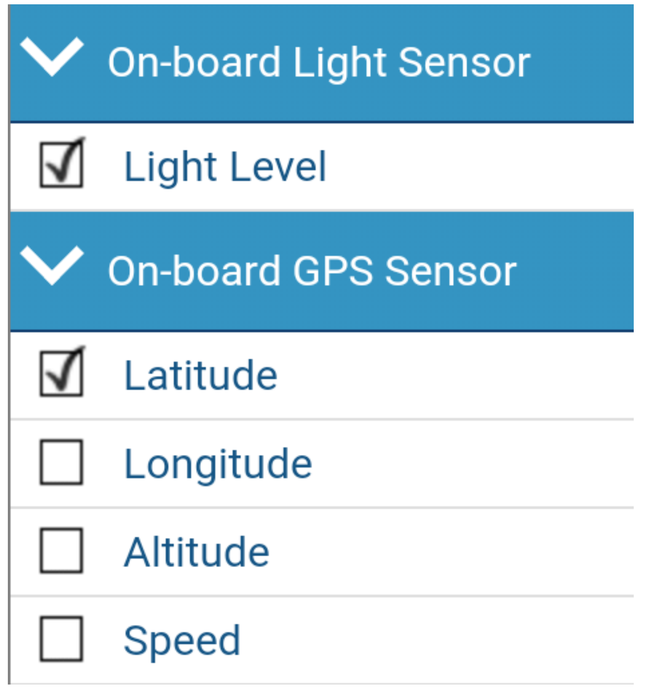
Inputs Available on Smartphones

iPhone



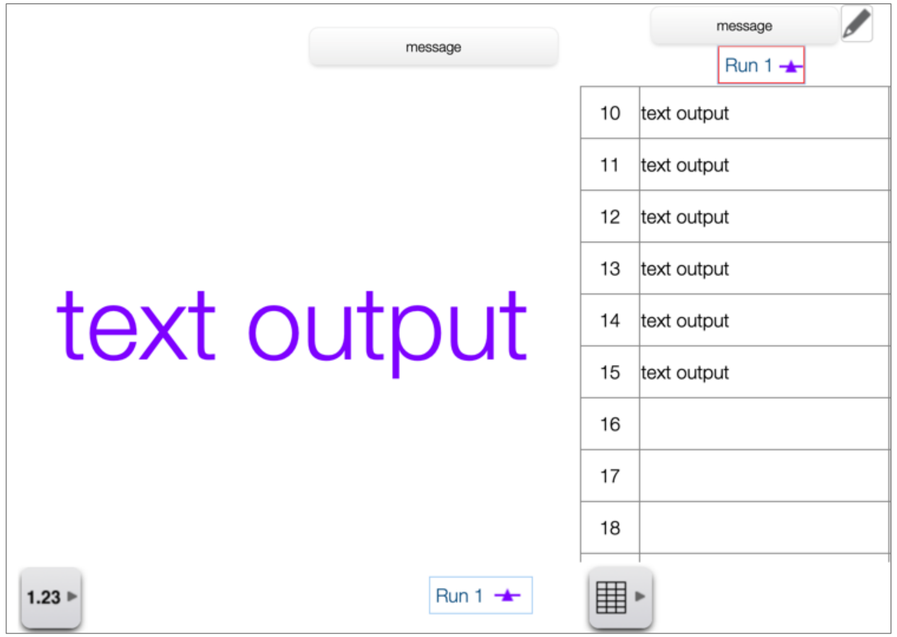
Android



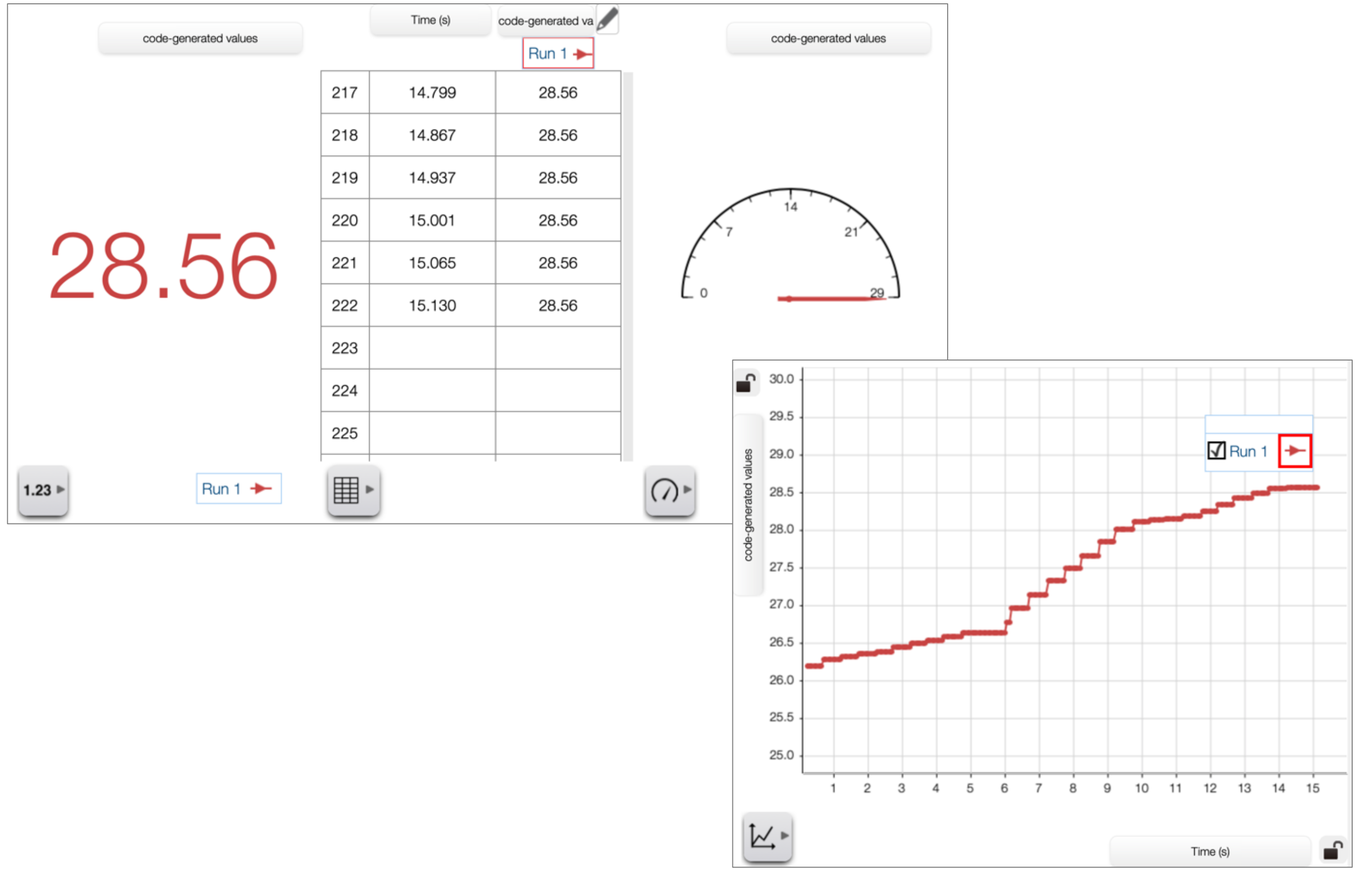


Outputs within SPARKvue

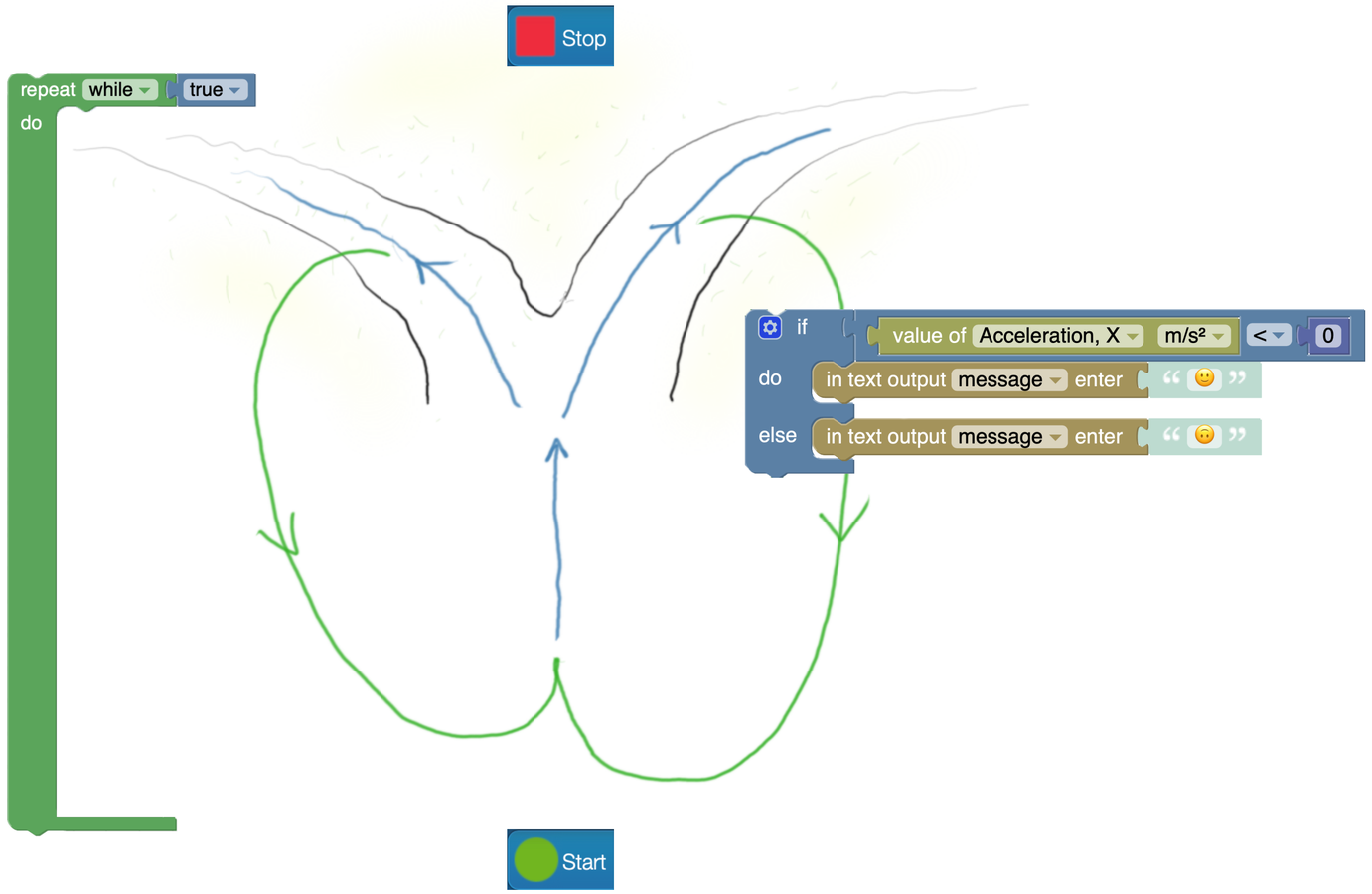
text



numerical



Program Flow



The Road Not Taken

BY ROBERT FROST

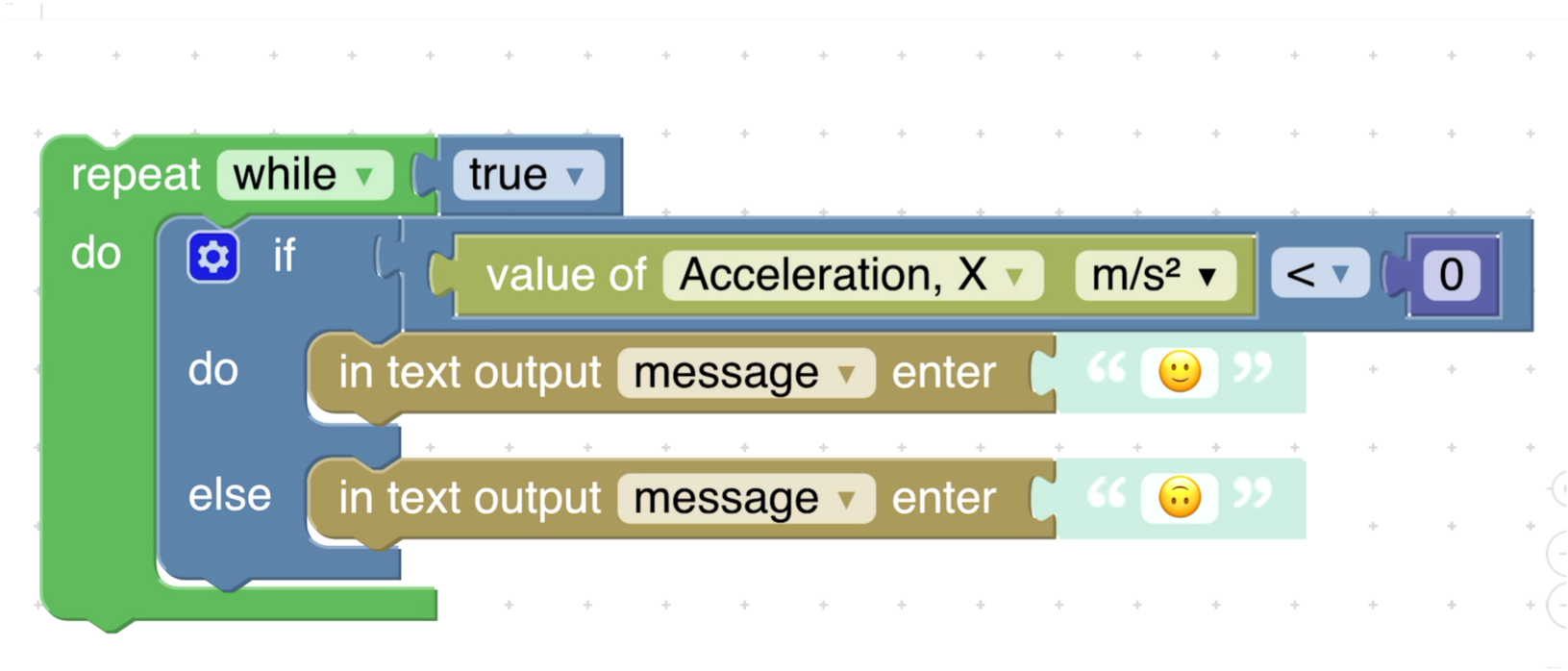
Two roads diverged in a yellow wood,
And sorry I could not travel both
And be one traveler, long I stood
And looked down one as far as I could
To where it bent in the undergrowth;

Then took the other, as just as fair,
And having perhaps the better claim,
Because it was grassy and wanted wear;
Though as for that the passing there
Had worn them really about the same,

And both that morning equally lay
In leaves no step had trodden black.
Oh, I kept the first for another day!
Yet knowing how way leads on to way,
I doubted if I should ever come back.

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.

Phone Orientation Final Code



Additional Ideas with Phone Sensors

Acceleration

- pendulum timer
- step counter
- digital protractor/inclinometer
- (visual) motion/burgler alarm
- shake detector (→ dice or Magic 8 Ball)
- handwashing timer
- freefall detector (careful!)
- cart bumper design tester (careful!)
- visual accelerometer
- rolling wheel rotation → speed calculator
- righthand rule indicator
- dead reckoning position estimation
- reaction timer (via tap)
- motion-driven emoji-animated storytelling

Sound Level

- classroom loudness monitor
- visual loudness mapping w/ multiple phones
- acoustic stopwatch
- clap on | clap off
- dog bark “translator”
- sound-driven emoji-animated storytelling

Light (Android)

- pendulum timer
- fridge door opening counter

GPS (Android)

- Geocaching guidance
- compass heading indicator
- hike elevation gained/lost monitor
- car speeding (visual) alarm

Activity 2: Investigating Sound Levels

see separate slides

Activity 3: Energy Flow

see separate slides

Activity 4: Chain on Pulley

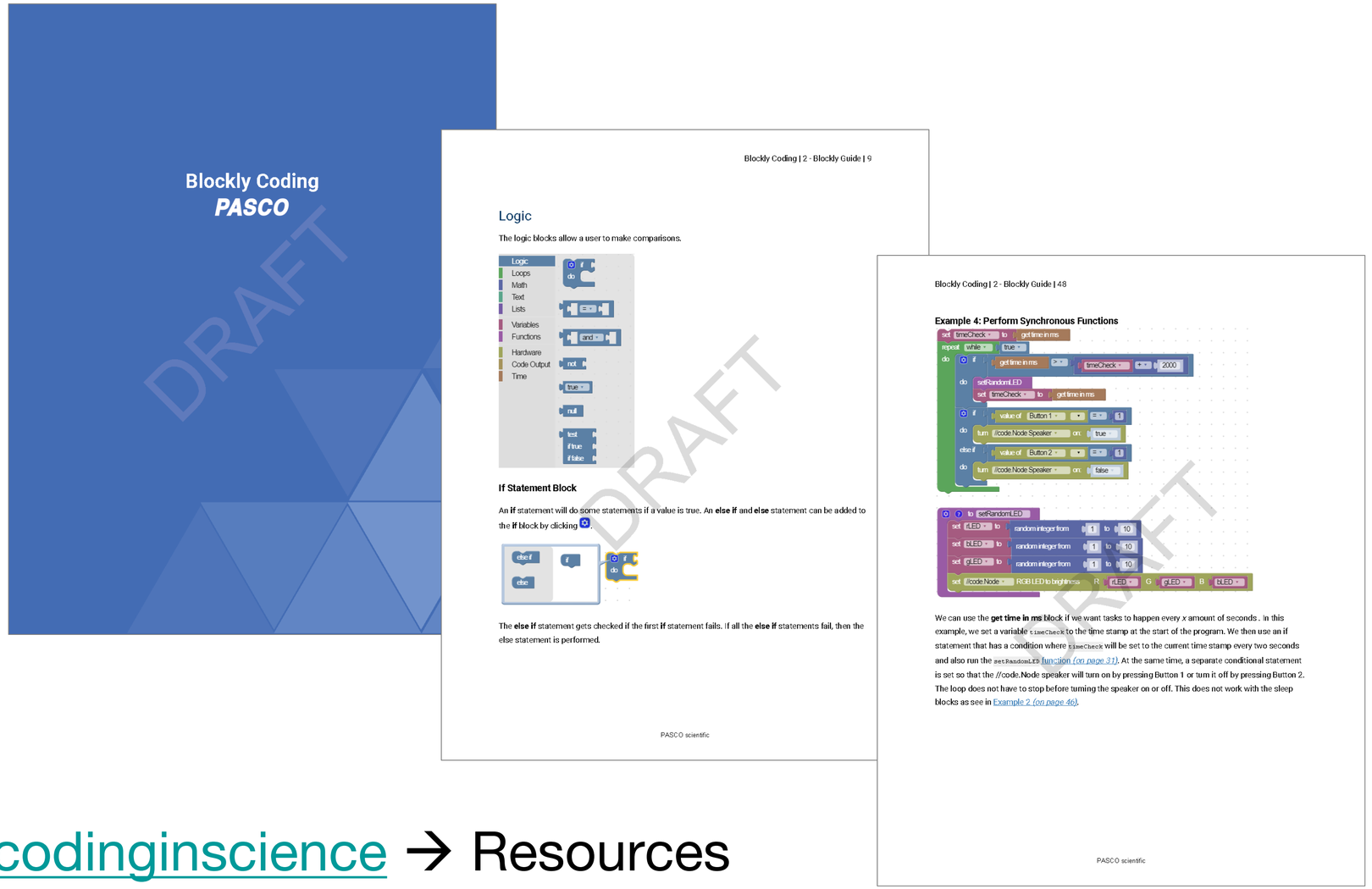
see separate slides

Hour of Code Tips

- Jump in, even if you don't know it all yourself yet. Look to students, school colleagues, community members, and this webinar's resources for help.
- Making coding mistakes and troubleshooting them is an expected part of the process and a key skill for programmers.
- When feasible, let your students' interests guide their explorations.
- Adapt to your students' (possibly widely varying) experience levels with coding. Consider:
  - grouping together students with diverse experience levels
  - for advanced students, coding from scratch, open-ended activities, extensions
  - providing partially-completed files for students to finish or fix:
    - complete complete except for variable values
    - "jigsaw puzzle" code for students to assemble
    - "broken" code for students to analyze and fix
- Celebrate your students' achievements and have fun.

visit https://hourofcode.com for more advice

Resources: Blockly Coding Reference



PDF in bit.ly/codinginscience → Resources

Additional Resources

- products
  - SPARKvue: pasco.com/sparkvue
  - PASCO Capstone: pasco.com/capstone
  - comparison: bit.ly/comparesvcs
  - Blockly coding: bit.ly/pascoblockly
  - sensors: pasco.com/sensors
  - //code.Node: pasco.com/codenode
- experiments and activities:
  - Experiment Library: pasco.com/resources/lab-experiments (search/filter by keyword, subject, grade level, equipment)
  - Distance Learning Resources: pasco.com/resources/distance-learning
  - activity ideas: pasco.com/resources/blog
- free videos:
  - YouTube: youtube.com/pascoscientific
  - How Do I videos: youtube.com/pascohowdoi

today's webinar files and resources:

bit.ly/codinginscience (Dropbox)

- social
  - Twitter: @pascoscientific
  - Facebook: facebook.com/pasco.scientific
  - Instagram: instagram.com/pasco.scientific
- live webinars: bit.ly/pasco-webinars
- Technical Support
  - email: support@pasco.com
  - chat: any page of pasco.com
  - phone: 800-772-8700 x1004 (inside US) or +1-916-462-8384 (outside US)
- PASCO folks:
  - Glenn: starkey@pasco.com
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  - Dan: dburns@pasco.com
  - your regional PASCO rep: pasco.com/support

Q&A

You can leave the session by closing GoToTraining.

We'd appreciate your feedback if you have a moment to complete the brief post-training evaluation that will appear. Thanks.