

Ph2M 2025 Agenda planning

Who:

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Website - <https://sites.google.com/view/ph2m/home>

Participants - 91 confirmed so far - goal is 100

[Google folder](#)

Main Zoom link: <https://csun.zoom.us/j/81842184692>

LMS

Use Canvas - <https://k12.instructure.com/courses/2050662>

Code for enrolling B9G386<https://k12.instructure.com/courses/2050662>
<https://k12.instructure.com/enroll/B9G386>

Teachers' Guide

Plenary - the whole group

Teams - groups of 16-18

Pods - groups of 4 or 5

Meeting 6/19 agenda

- Review schedule and Canvas site
- Icebreakers
 - Make a slide - copy the [template](#)
 - Make a quickwrite (copy the [template](#))
- Tuesday modeling sessions - pick topics
 - Review the steps to modelling
- Exit tickets? (what did you learn - suggestions)
- Discussion boards
- Backchannel for chat (turning off in zoom direct messages)
 - whatsapp?
- Things to do
 - Teachers guides for the activities

- Guiding questions
- Sequence of activities
- Resources to use
- Quickwrite starters
- Lists of teachers for each group
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2025 Agenda

Monday	Tuesday	Wednesday	Thursday	Friday
Introductions - icebreaker What is a Model? Model of a Vacuum cleaner System Thinking	CS standards compared to NGSS Genetics phenomena (dihybrid cross) and model	Modelling the earth Models of climate and systems Python	Assessing model based learning Spreadsheets and models with floating and sinking Group work	SAGE Modeler Group work Choice topic
Reading discussioni Pendulum analysis and model Intro to Scratch	Scratch genetics Model building practice Ball Drop	Models and perception NetLogo Group work	Collecting data from models AI and coding Group work	Presentations Feedback More resources

2025 Detailed Agenda

Breakout rooms

Presentation Numbers (P1, P2...)

Pre workshop homework - we are asking participants to:

- Complete the tutorial for [Simulation a Marine Ecosystem](#)
- Read a paper on [scientific modeling](#) (Kenyon, Schwarz and Hug, 2008)
- Read a paper on [CS Literacy](#) (Wilinsky, Brady, and Horn, 2014)

I am a huge metal fan

Day 1 - Scientific Modeling

- [Pre Survey](#)
- Introductions and announcements (10 minutes)
 - [Norm's norms of participation](#)
- Ice breakers
 - Quickwrite or Mentimeter questions (10 minutes)
 - Breakout rooms - introductions (20 minutes)
 - What are 2 things you like about your school and one you dont?
 - What is the strangest thing a student said to you?
 - Favorite science phenomena
- **P1 (Foley) Intro to computational models**
 - What is a model? [Slides](#)
 - [Gas starter](#) - computational model (30 minutes)
 - Goal - to learn a bit about the scratch interface
 - See how a starter model can enable computational modelling
 - Instructions/questions for participants
 - Demo the starter - what works and what does not
 - What should happen when you

Break

- **P3 (Herr) System Thinking (30 minutes)**
 - NGSS - why focus on [Systems](#)?
 - Modeling tool - [Diagrams.net](#) | [tutorial](#)
 - Model Example: [Homeostasis](#)

Lunch (45 minutes)

- **P2 (Foley) Model a phenomena *Vacuum cleaner* (60 minutes)**
 - Drawing first (fill out a slide)
 - Create a concept map of a VC - coggle [sample](#) - [draw.io sample](#)
 - How to make a copy link?

- Discussion
 - Start in small groups - copy the starter model
 - Return to big groups - share models
 - Have a [diagram](#) to share
- (back in main) blocking the hose - what happens to the sound? why
- Model refinement - Drawing? (before and after diagrams?)
- Each room picks best 2 models



- **P4 (Herr) Modeling Pendulums (80 minutes)**
 - Data Analysis - [Factors affecting period of a pendulum](#)
 - Model Development - factors affecting period of a pendulum
 - Model tool - Graphing & curve fitting with Google Sheets | [tutorials](#)
 - Model - Equation
 - Modeling with CS- [scratch pendulum](#) - GeoGebra [Pendulum](#)
 - CCC - Simple Harmonic motion
- Wrap up and Exit Tickets (10 minutes)

Day 2 - CS Standards

- Welcome back
- **P5 (Foley) Intro to Scratch (60 minutes)**
 - Cat walking Introduction
 - Support in rooms
 - Driving game
 - Support in rooms
 - Scratch Pendulum
 - Support in rooms
- Reading discussion - paper [scientific modeling](#) (Kenyon, Schwarz and Hug, 2008) (20 minutes)
 - Share out - why is modeling important? (10 minutes)

Break

- **P7 (Herr) Dyhybrid cross (90 minutes)**
 - Data Analysis - [Phenotype from a a dihybrid cross](#)
 - Model Development - Independent assortment of genes
 - Model - Punnet Square
 - Modeling tool - [Google Draw/Slides](#) | [tutorials](#)
 - Modeling with CS - scratch model of Punnet square for a [dihybrid cross](#)
 - CCC- phenotype & genotype; [dominant & recessive traits](#)

Lunch (45 minutes)

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- **P8 (Foley) Modeling Genetics (20 minutes)**
 - Exploring the Scratch di-hybrid cross.
 - How could we include the statistics in this (design discussion)

Break

- **P9 (All) Modeling Practice - choose a room (60 minutes)**
 - Reminder about the modeling steps
 - Pick a phenomena - and a room - for modelling
 - Photosynthesis - Jesika
 - Peppered Moth color with pollution - Andrew
 - Chromatography - Adrienne
 - Helium balloon in a car - Brian
 - Keystone species - sea urchins (HHMI unit) - Asmau
 - [Siphon](#) - Norm
 - Runner's acceleration - Paul
 - Share out
- **Discussion - modeling lesson brainstorm (20 minutes)**
 - Brainstorm
 - Vote on ideas
 - **Potential groups**
- **Wrap up and Exit Tickets (10 minutes)**

Day 3 - Climate Models

- Welcome back
- **Reading discussion** - paper on [CS Literacy](#) (Wilinsky, Brady, and Horn, 2014) (15 minutes)(20 minutes)
 - Share out - why is CS important?

- **P10 (Foley) Drop Ball Challenge** (20 minutes)
 - Make the ball drop
 - Make it realistic
 - Bouncing
 - Support in rooms
- **P11 (Herr) Biomes and climograph** (90 minutes)
 - Relation between water, temp and sun to create photosynthesis
 - Food web to show how the ecosystem fills out
 - Model 1 - physical factors affecting **photosynthesis**
 - Model 2 - of physical components of **ecosystems** with slides, coggle - graphic model
 - Earth as a system
 - **Phenomenon** - Uneven surface temperatures on earth
 - Data Analysis - [Patterns of surface temperature](#)
 - Model Development - radiation, absorption, reflection, evapotranspiration
 - Model - [Energy Balance](#) | [PhET](#)
 - Modeling tool - [Diagrams.net](#) ([Draw.io](#)) | [tutorials](#)
 - Modeling with CS - [scratch model](#) | [tutorial](#)
 - CCC - Energy exchange, [energy transfer](#)
 - **Phenomenon** - Biomes and ecosystem distribution
 - Data Analysis - [Precipitation, temperature & vegetation](#)
 - Model Development - Optimal conditions for growth of various organisms; physical factors affecting photosynthesis
 - Model - [Mind map of Biome diversity](#)
 - Modeling tool - [Coggle](#) | [Tutorial](#) | [biomes Coggle](#)
 - Modeling with CS - scratch models
 - CCC - Energy flow in ecosystems - [Food web](#)

Break

- **P12 (Foley) Explore Climate models - (60 minutes)**
 - Explore 4 models
 - Redesign plan (share a form for reporting bugs and suggesting features)
 - Other sims (phet, HHMI)
 - How to utilize simulations
 - Breakdown the model
 - Query the model
 - Reflecting and reinforcing

Lunch (45 minutes)

- **P6 (Foley) Computer Science Standards (60 minutes)**
 - Overview and intersection with NGSS (20 minutes)
 - Introduction - [slides](#)
 - Review the CS standards (20 minutes)

- Organize standards in teams - [slides](#)
 - Report back to the plenary
 - Lets review the driving game
 - Modify the driving game - calculate speed, distance, energy (20 minutes)
 - Support in rooms
- **P13 (Foley) Move the blob** (30 minutes)
 - Support in rooms

https://docs.google.com/presentation/d/1IsrL4Gad5e9WkR3UqVYNiOajfDf50wPQzoyRgodb_IQ/edit?usp=sharing

We are getting in teams to brainstorm ideas for the CS standards. Each group is going to add notes to the standards and highlight two to talk about.

Break

- Group work time (60 minutes)
 - Submit outline of lesson
- **P15 NetLogo introduction (45 minutes)** Wrap up and Exit Tickets (10 minutes)
- Wrap up and Exit Tickets (10 minutes)

Day 4 - Group work

- Welcome back
- **P16 (Foley) Assessing model building** (30 minutes)
 - Goals of model building
 - Assessing understanding
 - Meta-modeling knowledge
 - Assessing computational modelling
 - Rating assessment questions in groups
- **P17 (Herr) Phenomenon- Floating and Sinking** (60 minutes)
 - Data Analysis - [Factors affecting whether something floats or sinks](#)
 - Model Development - Newton's third law, Archimedes principle
 - Model development tool: [oPhysics vector tool](#)
 - Model: Vector diagrams
 - Modeling with CS - scratch model of Archimedes Principle
 - CCC - weather patterns, currents, etc.

Break

- Group work time (60 minutes)

Lunch (45 minutes)

- **P19 (Foley) AI and model construction (15 minutes)**
 - Chatgpt code generation
- Group work time (75 minutes)

Break

- **P20 SAGE Modeler** (45 minutes) *time permitting*
 - Introduce SAGE sage.concord.org
 - [Earth Energy System](#)
 - [Condensation](#)
 - Support in rooms
 - Starter model - [link](#)
 - Completed - [link](#)
 - Play with SAGE
- Group work time (45 minutes)
- Wrap up and Exit Tickets (10 minutes)

Day 5 - Presentations

- Welcome back
- Group work time (60 minutes)

Break

- **Breakouts - Choose your own topic**
 - Scratch - Brian
 - Draw.io - Norm
 - Sheets - Paul
 - Canva - Jesika
 - Slides - Asmau
 - TinkerCAD - Adrienne

Lunch (45 minutes)

- **Group lesson presentations**
 - Describe the phenomena
 - How students will engage
 - Models used/constructed

- Assessment
 - **Final Logistics**
 - Submit lessons
 - Peer review instructions (due in 1 week)
 - Resources to share with your department
 - Paperwork for stipends
 - Instructions - [link](#) (dont post on canvas)
 - Final survey
 - **Finish early?**
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The model construction process

1. Dissect the phenomena
 - a. What are the elements? (what matter is involved?)
 - b. What is the sequence? (what happens?)
 - c. When does it occur or not occur? (under what conditions?)
2. Create pictorial representation
 - a. Cartoon sequence
3. Describe interactions (forces and/or energy)
 - a. Concept map
4. Computational model
 - a. Create sprites that behave according to the model
 - b. Test for different conditions

Class structures for large online class

- Whole group Zoom (100 participants)
 - Open chat? This will go fast
- Moderated Breakout rooms (5 rooms of 20)
 - Breakout rooms or separate zooms?
 - Good for Q&A
 - Sharing work (eg. drop ball)
 - Can we save breakout rooms for the whole week?
- Small Breakouts (4-6 participants) <<< Norm likes this approach
 - Discussing readings - problem solving
 - Each group works on a slide

- Choose your topics Breakout rooms (participants choose)
 - Help with specific technology
 - Scratch
 - Coggle
 - Google sheets
 - Net Logo
 - Or subject matter
 - Life science
 - Chemistry
 - Physics
 - Earth science

Other Communication

- Resources pages
 - Scratch
 - Modeling
 - NetLogo?
- How to Videos
- Exit tickets each day
- Train an AI bot?

Potential Activities:

Include	Possibly Activities/phenomena
Day 1 • Ice breakers • Survey • Gas starter • What is a model? • Model a phenomena ◦ Concept map • Computer Science Standards ◦ Why CS ◦ Sort the standards • Intro to scratch ◦ Cat walking ◦ Driving game	• Move the blob • Identify parts of model • Water boiling model ◦ Drawing ◦ Macro and micro models ◦ Computational model • Dihybrid cross with corn ◦ Describe phenomena ◦ Explore the data ◦ Build a model (square) ◦ Make a simulation (scratch) • Scratch sound monitor • Sage Modeller • Octostudio (coding with phones) • Netblox

Day 2

- Drop ball
- Choose a phenomena (5)
 - Leader's choice
 - Identify parts of the model
 - Multiple representations
 - Brainstorm computational model
- Talking about modeling projects
 - Pick a topic to work on

Day 3

- Climate change models
- How we can use AI to help with modeling
- Start work on projects

Day 4

- Refining a model based on data
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Day 5

- Building lesson plans
- Small group presentations
- Feedback survey

- Simultaneous coding
- Phenomena with scratch models
 - [Pikas model](#)
 - [Water boiling](#)
 - [Protein synthesis](#)
 - Photosynthesis
 - [Sound waves](#)
 - [Thinkertools](#) (impulses and motion)
 - [Predator prey](#)
 - [Projectile motion](#)
 - [Active transport](#) (cell membrane)
 - [Wacky gears](#)
 - [Heat islands](#)
 - [Condensation](#)
 - [Mouse velocity](#)
- Phenomena - no scratch yet
 - Touching metal - why does it feel cold
 - Northern lights
 - Desert mirage
 - Keeling curve
 - Lightning
 -
- Dynamic model - [peppered moths](#)

Norm's suggests

- Dihybrid cross (2 hours - tuesday)
- Biomes and climograph (2 hours - wed)
 - Relation between water, temp and sun to create photosynthesis
 - Food web to show how the ecosystem fills out
- Period of a pendulum (3 hours)
 - Create scratch pendulum?
- Systems discussion
 - Urban heat islands
- Buoyancy and density
 - Model floating

