

High School Science Maternity Leave Sub Plans, 6 Weeks

Six complete week binders of high school science, grades 9 to 12. One topic a day on paper, solo work and a team task, a "say this" script for every task.

PREVIEW

What is included

- Six week binders (71, 71, 73, 68, 68, 68 pages): 419 pages
- 78 front pages: binder cover, important information, note to the sub, the week plan filled in, schedule, set index, class list, how it went, Monday opener
- 60 solo blocks (30 science sets, 30 calm blocks) and 30 team tasks for groups of four
- A "say this to the class" script for all 126 tasks: 2 or 3 sentences the sub reads out
- A core task and a ★ challenge in every science set and team task
- Every science set lists the NGSS performance expectations it practices
- 30 optional games, each on that day's lessons (Day 30: on the big review of all six weeks)
- Answer keys for everything; color and ink-saver B&W, US Letter and A4

How it works

1. Leave the six binders out. Each has its own filled-in plan with page numbers.
2. The sub reads the "say this" box out, then runs the day's science set in every period. Everyone does the core task, early finishers go on to the ★ challenge.
3. The calm block fits any gap, the team task fills a block period or extra time, the game the last 15 minutes.
4. No prep and no tech: paper and pencil, print and go.

The 30 days: a science set, a team task and a game

- **Week 1, days 1 to 5. Science:** Scientific Method and Data; Cells and Genetics; Chemical Reactions; Forces, Energy and Work; Ecology and Climate Data. **Team:** The Paper Pack Audit, The Unlabeled Culture, The Mass Balance Relay, The Elevator Bid Review, Beavers for Willow Creek.
- **Week 2, days 6 to 10. Science:** Measurement, Units and Precision; Cell Transport and Homeostasis; Decay and Half-Life; Gravity and Orbits; Plate Tectonics and Earth's Interior. **Team:** The Estimate Build, Membrane Border Control, The Darrow Bend Dig, The Orbit Planner, The GPS Plate Map.
- **Week 3, days 11 to 15. Science:** Evaluating Scientific Claims; Cell Division and Specialization; Reaction Rates and Collision Theory; Electromagnetism: Motors and Generators; Water, Weathering and Earth's Feedbacks. **Team:** The Evidence Ladder, The Root Tip Census, Collision Snapshots, The Hut Generator, The Feedback Loop Builder.
- **Week 4, days 16 to 20. Science:** Engineering Design and Tradeoffs; Meiosis and Genetic Variation; Energy in Chemical Reactions; Electromagnetic Waves and Communication; Natural Hazards and Risk. **Team:** The Bridge Is Closed, The Meiosis Storyboard, The Unlabeled Energy Diagrams, The Parity Bit Relay, The Shelter Site Search.
- **Week 5, days 21 to 25. Science:** Modeling Population Growth; Evidence for Evolution; Intermolecular Forces and Materials; Heat and Thermal Equilibrium; Stars, the Sun and the Big Bang. **Team:** The Lake Restocking Game, The Plant Family Tree, Boiling Point Bets, The Mystery Metal Files, Two Star Life Paths.
- **Week 6, days 26 to 30. Science:** From Question to Conclusion: The Lab Report; Biodiversity and Ecosystem Change; Equilibrium and Le Chatelier's Principle; Electric Charge and Coulomb's Law; Big Review of Six Weeks. **Team:** The Review Panel, The Linden Valley Corridor, The Stress Card Duel, The Charged Bead Notebook, The Six-Week Relay.

Optional game every day, on that day's lessons (Day 30: the game is on the big review of all six weeks): Mon **Whiteboard Quiz Game** Tue **Paper Password** Wed **Class Feud** Thu **Classroom Millionaire** Fri **Mystery Box**

What this preview shows: the note to the substitute, the Week 1 plan, more front pages, one page of every daily part, a full science set with its key, a calm block, a team task, the game types and one ink-saver page. Every product page is watermarked. The full product has 419 pages.
What the sub gets: a note that explains the routine, a "say this" script for every task (126 in all), a sub script for every Monday opener, a "Read this out" box on most games, and every answer in the key.



Note to the Substitute

Grades 9 to 12 · five days · every set runs from the printout alone

Thank you for covering my classes this week

Everything you need is in this binder. The weekly plan is filled in for you. I fill in the important information page and the class list before you arrive; if anything there is still blank, please fill in what you can. After the binder pages come the five days in order, Monday to Friday. Monday starts with a short opener (about 15 minutes), then each day has its work sets: **Science 1** is Monday's set, **Science 2** is Tuesday's, and so on to **Science 5** on Friday. Run the day's set in every period you teach that day. Each set is one period (45 to 55 minutes), stands alone, and has its own answer key at the back of the binder, so you never have to make anything up or know the subject. Every task starts with a short **Say this to the class** box under its title: read it out, and the class knows what to do and how to start.

Every science and team page has a core task first, then a ☆ challenge. Every student does the core task. Students who finish early go on to the ☆ challenge; it fills a few extra minutes, and nobody has to finish it.

Each day's work set is followed by that day's calm block, team task and game. The **calm block** is always allowed: for time left at the end, a loud class, or anyone who finishes early. The **team task** fills a period on its own. The **game** is optional: a fun way to end the class, or something for extra time. Fifteen minutes, from the script; items marked (calm) or (team) can be skipped if the class did not do that part.

Every science set lists the standards it practices on a small line under its title (for you, not the students): the high school performance expectations of the Next Generation Science Standards (NGSS). A sub plan set practices part of a standard; it is review and practice, not a full assessment of it. Every set is a self-contained reading with its own data, so it works in any science class: biology, chemistry, physics, earth and space, or environmental science.

Each day has

- One Science set (one period, core task + ☆ challenge on every page)
- A calm and quiet block: learn 8 terms from the day's topic, then a quiet self-test
- A team task for groups of four
- A paper game from the script

If the class is loud

- Set a voice level with a number, 0 to 3, and use it all week (the Day 1 opener explains it).
- Switch to the calm block. Nobody needs to move.
- If a set is not working, stop it and use the calm block or the team task. Every set starts cold.

At the end of each day

Please fill in that day's line on the "How it went" page. It takes two minutes and I read every word.

For the teacher who bought this kit: if it worked well for your class, leaving a review where you bought it, on TpT or classroomreview.games, helps other teachers find it. Thank you!

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This Week's Plan

Filled in for you: run the day's set in every period you teach. Keep it as it is, or use the blank schedule on the next page for your own order.

WHEN	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Start of class	**Meet Your Sub** p. 11 · 15 min, every period	Attendance, voice level	Attendance, voice level	Attendance, voice level	Attendance, voice level
Main work, every period	**Science 1** Scientific Method and Data p. 14	**Science 2** Cells and Genetics p. 23	**Science 3** Chemical Reactions p. 32	**Science 4** Forces, Energy and Work p. 41	**Science 5** Ecology and Climate Data p. 52
Early finishers or a loud moment	**Learn and Test: Measurement Terms** p. 17	**Learn and Test: Cell and Heredity Terms** p. 26	**Learn and Test: Reaction Terms** p. 35	**Learn and Test: Force and Machine Terms** p. 45	**Learn and Test: Climate and Life Terms** p. 56
Block period or extra time	**The Paper Pack Audit** p. 19	**The Unlabeled Culture** p. 28	**The Mass Balance Relay** p. 37	**The Elevator Bid Review** p. 47	**Beavers for Willow Creek** p. 58
Last 15 minutes (optional): a fun way to end the class, or for extra time	**Whiteboard Quiz Game** p. 21	**Paper Password** p. 30	**Class Feud** p. 39	**Classroom Millionaire** p. 50	**Mystery Box** p. 60

How to use this plan

- Page numbers point to the first page of each set. Copy work sets and calm blocks one per student. Team tasks: copy them as the copy line on each task's first page says (per group or per student), plus any cards or sheets it asks for. Copy any page that gets torn apart (role cards, game cards) one-sided, on its own sheet, so the page on its back stays whole. Game scripts are for you only (do not copy them). Game boards: copy the board page one-sided and tape up the copy, never the binder page (the page on its back is still needed).
- The calm block is always allowed: time left at the end, a loud class, or anyone who finishes early.
- On Monday the opener takes the first 15 minutes, so stop the set where the bell falls; finish page 3 as early-finisher work on Tuesday or leave it for another day.
- The game is optional: a fun way to end the class, or something for extra time.

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HS SCIENCE SUB PLANS WEEK 1

High School Science, Any Course, 5 Days of Print and Go Work

Teacher _____

Room _____

Grade and classes _____

Week of _____

Everything a sub needs for five days is in this binder: a filled-in weekly plan, a blank schedule, the class list, and for every day one Science set, a calm block, a team task and a paper game. Each set is one period, stands alone, and has its own answer key. Nothing needs subject knowledge, a login or a projector.



Important Information

The page the sub reads first. Fill it in once and keep it current.

People to call

Office _____

Teacher next door _____

Nurse _____

Principal / admin _____

Tech help _____

Emergency procedures

Fire: exit and meeting point _____

Lockdown _____

Severe weather _____

Medical _____

Where the first aid kit is _____

Helpful students

_____

_____

_____

Students who need extra support

_____

_____

_____

Where things are

Attendance / how to take it _____

Paper, pencils, supplies _____

Hall passes _____

Copier, if the sub may use it _____

Class routines

Start of class _____

Bathroom _____

Phones _____

End of class _____

Weekly Schedule (Blank)

Your own order: write the set for each period (Monday: Science 1, Tuesday: Science 2, and so on) and the class next to each period. Cross out or rename periods to match the school day.

PERIOD / CLASS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Period 1 ____ · ____ Class: _____					
Period 2 ____ · ____ Class: _____					
Period 3 ____ · ____ Class: _____					
Period 4 ____ · ____ Class: _____					
Period 5 ____ · ____ Class: _____					
Period 6 ____ · ____ Class: _____					
Period 7 ____ · ____ Class: _____					

How to fill it in

- One set per period. Each set runs 45 to 55 minutes; if a period runs longer, the ☆ challenges fill a few minutes, or add that day's team task.
- Same subject all day? Write the day's set in every period you teach. Planning, lunch and duty periods: cross them out.
- On Monday the opener (15 minutes) comes first in every period, then the set.
- The game is optional: put it in the last 15 minutes of any period as a fun way to end the class, or use it for extra time. The calm block goes in any gap.

Set naming

Sets are named by subject and day: **Science 1** is Monday's set, **Science 2** is Tuesday's, and so on to **Science 5** on Friday. The set index lists every set with its minutes and page.

Set Index (1 of 3)

Every set in the binder with its length and page. Day = the weekday it is written for. Any science set works on any day; each game reviews its own day's set.

DAY	SET	WHAT IT IS	MINUTES	PAGE
SCIENCE, DAYS 1 TO 5				
1	**Science 1: Scientific Method and Data**	**Reviews:** hypotheses, independent, dependent and controlled variables, mean and range of trials, and the shape of a graph. Variables and controls, a 5 by 3 trial data set to average, a graph to finish, computed questions, a star challenge on every page. Key included.	50	p. 14
2	**Science 2: Cells and Genetics**	**Reviews:** genes and alleles, genotype and phenotype, Punnett squares with ratios and percents, incomplete dominance, codominance and blood type. Alleles and inheritance, eight key terms, four Punnett squares with ratios, five questions, a star challenge on every page. Key included.	50	p. 23
3	**Science 3: Chemical Reactions**	**Reviews:** conservation of mass, balancing equations with coefficients, and sorting reactions into five types. Conservation of mass and the five reaction types, eight equations to balance and classify, two atom tally proofs, harder equations. Key included.	50	p. 32
4	**Science 4: Forces, Energy and Work**	**Reviews:** force, work, power and energy calculations with units, and how speed changes kinetic energy. Seven formulas, four worked examples, sixteen practice calculations, six word problems, a braking distance challenge. Key included.	50	p. 41
5	**Science 5: Ecology and Climate Data**	**Reviews:** the carbon cycle, the carbon dioxide record and its rate, carrying capacity, limiting factors and predator and prey cycles. The carbon cycle and carrying capacity: a sixty year carbon dioxide record to graph, a made-up island survey, computed questions. Key included.	50	p. 52
MONDAY OPENER				
1	**Meet Your Sub**	Fifteen minutes at the start of every period on Monday: sub sheet, three questions, the agreement and voice levels. Spare: a keyed Testable or Not?	15	p. 11

Class List and Dismissal

Names, what a sub must know, and how every student goes home. Copy one per class.

(B) bus (write the number) (W) walks (P) picked up (write who) (A) after-school program (O) other

☆ in the notes: a student who finds the core task easy may start with the challenge

#	STUDENT NAME	NOTES (allergies, needs, helpful, leaves early)	HOME	BUS # / PICKED UP BY / PROGRAM
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

How It Went

For the substitute. One line per day, two minutes at the end of each day. Check the boxes and go.

Monday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes

Notes / stars of the day: _____

Tuesday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes

Notes / stars of the day: _____

Wednesday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes

Notes / stars of the day: _____

Thursday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes

Notes / stars of the day: _____

Friday

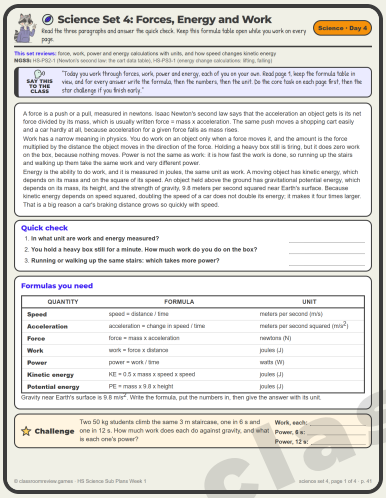
Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes

Notes / stars of the day: _____

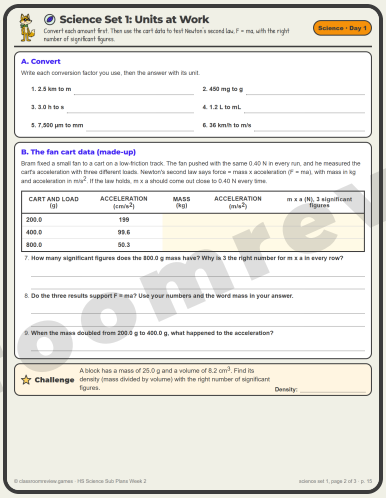
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ONE PAGE OF EVERY DAILY PART

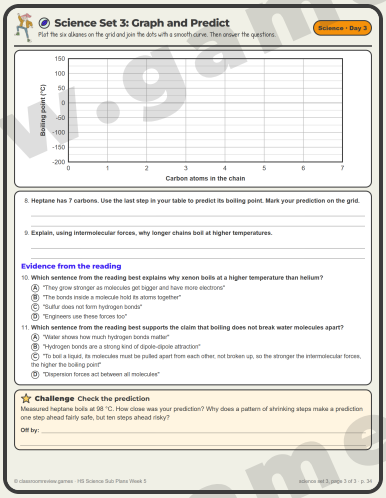
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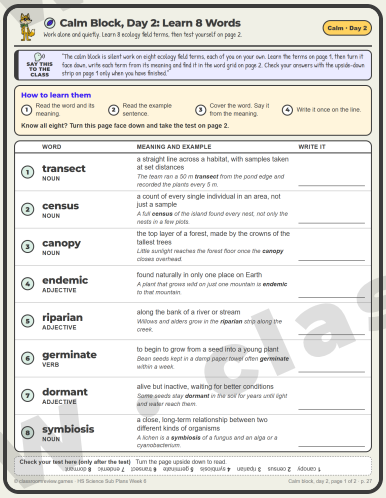
Science set: the lesson, Week 1 (solo)



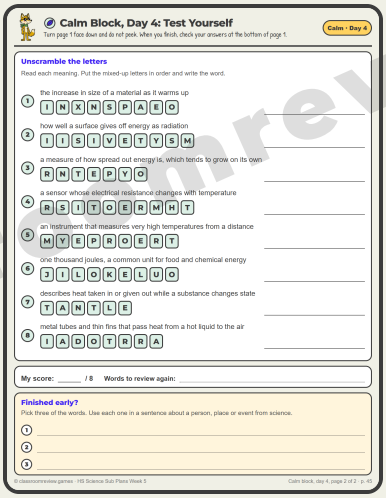
Science set: practice, Week 2 (solo)



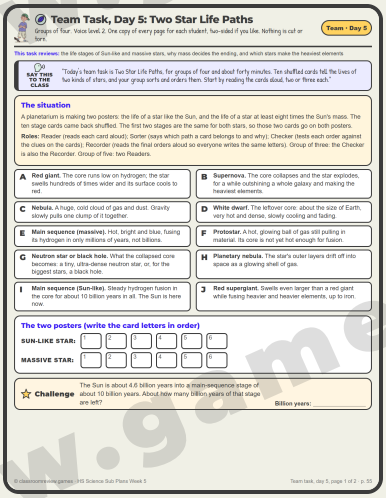
Science set: the third page (solo)



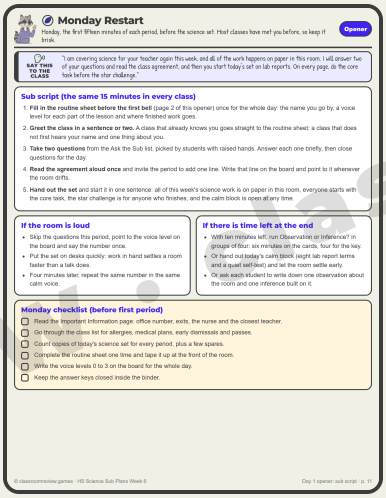
Calm block: learn 8 words (solo)



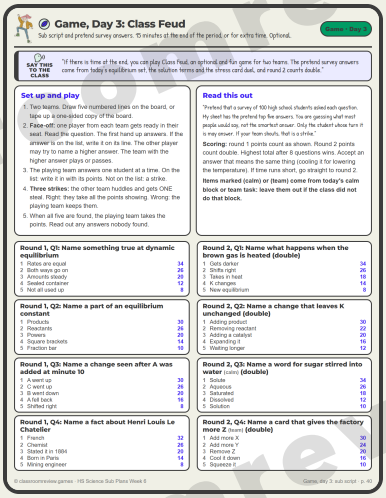
Calm block: test yourself (solo)



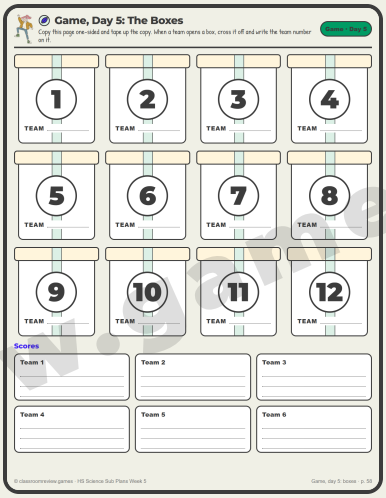
Team task (groups of four)



Monday opener (whole class)



Game: Class Feud (whole class)



Game: Mystery Box (whole class)

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Every day: a science set, a calm block, a team task and an optional game



Science Set 1: Modeling Population Growth

Read the three paragraphs, then answer the questions under them. Pencil and paper only.

Science · Day 1

This set reviews: models and predictions, exponential and logistic growth, carrying capacity and limiting factors, and testing a model against data
NGSS: HS-LS2-1 (carrying capacity: a duckweed growth model)

SAY THIS TO THE CLASS "Today you test a population model against real-looking data, the way an ecologist would. Read the three paragraphs on page 1 first, because pages 2 and 3 use them. Do the core task on each page first, then the star challenge when you finish."

A scientific model is a simplified version of something real that lets you make predictions you can test. A population model predicts how the number of individuals of one species in one place changes over time. The simplest model assumes that every individual keeps reproducing at the same rate, with unlimited food and space. Under ideal laboratory conditions, the bacterium *Escherichia coli* can double in as little as 20 minutes, so one cell could become millions in a single afternoon. Growth like this, where the population is multiplied by the same factor in each time step, is exponential growth, and its graph is a J-shaped curve that bends ever more steeply upward.

No real population grows that way for long. Food, water, space, light and nesting sites run short, and predators and disease take a larger share as numbers rise. These limiting factors slow growth until the population levels off at the carrying capacity, written K: the maximum population size that a particular environment can support. A model that includes this slowing is logistic growth, and its graph is an S-shaped curve. Growth is fastest in the middle of the S, when the population is about half of K, and slowest near the start and near the top.

A model is only as good as its match to the data. Scientists compare predictions with measurements, look for the point where they part ways, and then change the model. The human population is a working example. The United Nations marked 15 November 2022 as the day the world reached 8 billion people, and its 2024 projections show growth slowing to a peak of around 10.3 billion people in the mid-2080s. A projection is a model's prediction, so it is revised whenever new data arrive.

Try it

1. **Name the shape of the graph for exponential growth and for logistic growth.**

2. **What is the carrying capacity of an environment? Name three limiting factors from the reading.**

3. **At what population size is logistic growth fastest?**

Challenge One *E. coli* cell doubles every 20 minutes for 3 hours with unlimited food. How many doublings is that, and how many cells at the end?

Doublings: .....

Cells: .....

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Science Set 1: Model Versus Data

Fill in the model column, then the difference column. Model = 20 x 2 for every week that has passed.

Science · Day 1

Quilla's duckweed tank (made-up counts)

Quilla, a student, floated 20 duckweed fronds (tiny floating leaves) in a sunny classroom tank and counted the fronds every Monday for 8 weeks. Duckweed is a real water plant, but these counts are made-up. Her model: the number of fronds doubles every week.

WEEK	0	1	2	3	4	5	6	7	8
Fronds counted	20	40	78	150	260	380	455	485	495
Doubling model								not needed	not needed
Model minus count								not needed	not needed

4. **In which week does the model first overshoot the count by more than 10 percent of the count? Show the check.**

5. **By week 6, how many fronds does the model predict, and how many times more is that than Quilla counted?**

6. **Write the weekly gains (count minus the week before) from week 0 to 8. Between which two weeks was growth fastest?**

7. **Use the reading to explain why the fastest growth falls where it does.**

Challenge The UN marked 8 billion people in 2022 and projects a peak of around 10.3 billion. How many more people is that, and about what percent increase?

More people: .....

Percent: .....

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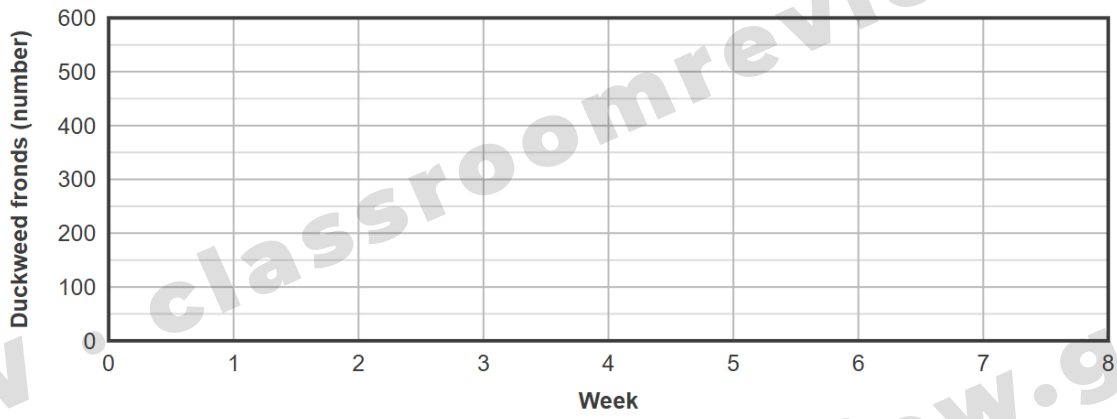
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Science Set 1: Graph the Tank

Plot all nine counts as dots and join them with a smooth curve. Then answer the questions.

Science · Day 1



8. **Draw a dashed horizontal line where you think the carrying capacity is. About how many fronds can the tank support?**

9. **Is the curve you drew J-shaped or S-shaped? What does that tell you about the doubling model?**

10. **Name two limiting factors that could stop duckweed in a classroom tank, and say how Quilla could test one of them.**

Evidence from the reading

11. **Which sentence from the reading best explains why the duckweed count levels off?**
    - (A) "Under ideal laboratory conditions, the bacterium *Escherichia coli* can double in as little as 20 minutes"
    - (B) "Food, water, space, light and nesting sites run short, and predators and disease take a larger share as numbers rise"
    - (C) "A model is only as good as its match to the data"
    - (D) "The human population is a working example"

12. **Which sentence from the reading best supports the claim that the UN's 10.3 billion figure could change?**
    - (A) "A population model predicts how the number of individuals of one species in one place changes over time"
    - (B) "No real population grows that way for long"
    - (C) "Growth is fastest in the middle of the S"
    - (D) "A projection is a model's prediction, so it is revised whenever new data arrive"

☆ Challenge A bigger tank

Renzo moves the duckweed into a tank with twice the water surface and the same light. Predict the new carrying capacity and explain your reasoning.

New K:

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Answer Keys (1 of 10)

Day 1. Teacher copy. Keep these pages out of the student sets.

Day 1 opener: Match the Curve, answers

1. C (the same amount of water is added each minute). **2. A** (plenty of food and no predators: each generation is larger than the last by a growing amount). **3. D** (nothing is added or taken away, so the weight does not change). **4. B** (fast growth in the middle of summer, then it stops at its adult height). **5. C** (the same amount every week). **6. B** (it spreads fast, then slows because almost everyone has already heard it). **7. A** (every patch makes more mold, so the growth speeds up while there is bread left). **8. D** (the water is already at room temperature, so it stays the same (accept B with a reason about cold water warming up)).

One point for each right letter, one more for a sensible reason. Score: 16 points at most. Card 6 may also be argued as A for the first few days; accept B or A with a reason about the time span.

Science Set 1: Modeling Population Growth

Try it: 1. Exponential: J-shaped; logistic: S-shaped. 2. The maximum population size that a particular environment can support; any three of food, water, space, light, nesting sites, predators, disease. 3. At about half of K. **Page 1 star challenge:** 9 doublings; 2^9 = **512 cells**.

Table: model 20, 40, 80, 160, 320, 640, 1,280; model minus count 0, 0, 2, 10, 60, 260, 825. 4. **Week 4**: 320 minus 260 = 60, more than 10 percent of 260 (26); week 3 is only 10 over 150. 5. 1,280 fronds; 1,280 / 455 is about **2.8 times** (accept about 3). 6. Gains 20, 38, 72, 110, 120, 75, 30, 10; fastest between **week 4 and week 5** (+120). 7. Logistic growth is fastest at about half of K: the tank held 260 fronds at the start of that stretch, about half of the roughly 500 it can support. **Page 2 star challenge:** 10.3 minus 8 = **2.3 billion**; 2.3 / 8 = about **29 percent**.

Graph: the dots rise slowly, then steeply, then level off just under 500. 8. About **500 fronds** (accept 490 to 510). 9. S-shaped: the doubling (exponential) model only works for the first few weeks, while resources are plentiful. 10. Accept two of: water surface space, light, nutrients in the water, temperature; a test changes one factor (for example the same tank with plant food added) and compares counts. 11. B. 12. D. **Page 3 star challenge:** about 1,000 fronds, if space on the water surface is what limits the duckweed (accept a reasoned smaller number if light or nutrients are named as the limit).

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Calm Block, Day 1: Learn 8 Words

Work alone and quietly. Learn 8 population ecology terms, then test yourself on page 2.

Calm · Day 1

SAY THIS TO THE CLASS

"Quiet, solo work now: eight population terms in the calm block. Learn them on page 1, flip it over, and on page 2 pair each meaning with its term. Then turn page 1 over again and check yourself against the key printed upside down."

How to learn them

1. Read the word and its meaning.
2. Read the example sentence.
3. Cover the word. Say it from the meaning.
4. Write it once on the line.

Know all eight? Turn this page face down and take the test on page 2.

	WORD	MEANING AND EXAMPLE	WRITE IT
1	**overshoot** NOUN	a population rising above its carrying capacity for a while *After a mild winter the deer herd went into **overshoot** and stripped the meadow bare.*	_____
2	**immigration** NOUN	individuals moving into a population from somewhere else ***Immigration** of birds from a nearby island raised this year's count.*	_____
3	**emigration** NOUN	individuals leaving a population to live somewhere else ***Emigration** of young wolves keeps the home pack from growing too large.*	_____
4	**dispersal** NOUN	the spreading of young, seeds or spores away from where they started *Wind helps the **dispersal** of maple seeds, which spin away like tiny wings.*	_____
5	**irruption** NOUN	a sudden, sharp rise in the number of a species in an area *A poor cone crop in the north set off an **irruption** of pine siskins farther south.*	_____
6	**natality** NOUN	the birth rate of a population *A warm, wet spring raises the **natality** of frogs in the pond.*	_____
7	**fecundity** NOUN	how many offspring an organism is able to produce *A cod's **fecundity** is huge: one female can release millions of eggs.*	_____
8	**stabilize** VERB	to settle at a steady level and stop rising or falling *The goat numbers **stabilized** once every patch of grass on the island was grazed.*	_____

Check your test here (only after the test) Turn the page upside down to read.

1 stabilize 2 emigration 3 dispersal 4 irruption 5 overshoot 6 fecundity 7 natality 8 immigration

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Team Task, Day 2: The Plant Family Tree

Groups of four. Voice level 2. One copy of every page for each student, two-sided if you like. Each member reads out only their own card.

Team · Day 2

This task reviews: shared traits as evidence of common ancestry, building a branching tree from a trait table, and reading which plants share the most recent ancestor

SAY THIS TO THE CLASS "Today's team task is The Plant Family Tree, for groups of four and about forty minutes. Each of you holds a card about plant traits, and together you build a family tree for five plants and an alga. Start by reading your own trait card aloud to the group."

The situation

A botanical garden wants a branching tree for five land plants and a green alga: Rose, Moss, Pine, Green alga, Grass, Fern. Biologists build such trees from shared traits: plants that share more of the newer traits branched apart more recently, so they sit closer together on the tree.

Roles: Trait keeper 1 (holds Card 1 and keeps time); Trait keeper 2 (holds Card 2 and checks each row of the table); Trait keeper 3 (holds Card 3 and draws on the tree outline for the group); Trait keeper 4 (holds Card 4 and reads the final tree aloud so everyone copies it). Group of three: trait keeper 3 also holds Card 4 and reads the final tree aloud. Group of five: two members share Card 2.

Card 1
Embryo starts growing inside the parent plant, which feeds it: Moss, Fern, Pine, Rose, Grass.

Card 2
Vascular tissue (tubes that carry water): Fern, Pine, Rose, Grass.
Seeds: Pine, Rose, Grass.

Card 3
Flowers: Rose, Grass.

Card 4
One seed leaf inside each seed: Grass.

Trait table

Put a check in the box for every trait a plant has, then count the checks in each row.

PLANT	EMBRYO FED BY PARENT	VASCULAR TISSUE	SEEDS	FLOWERS	ONE SEED LEAF	TOTAL
Rose						
Moss						
Pine						
Green alga						
Grass						
Fern						

Challenge Which trait is shared by every organism except one? Which one is the odd one out?

Trait: .....

Odd one: .....

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Game, Day 1: The Board

Copy this page one-sided and tape the copy to the whiteboard (or draw the grid). Cross squares off as they are played.

Game · Day 1

REPORTS	FLOCKS	FLOCK DATA	TERMS	REVIEW
100	100	100	100	100
200	200	200	200	200
300	300	300	300	300
400	400	400	400	400
500	500	500	500	500

Scores

Team 1	**Team 2**	**Team 3**
Team 4	**Team 5**	**Team 6**

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Game, Day 2: Paper Password

Sub script and science word list. 15 minutes at the end of the period, or for extra time. Optional.

Game · Day 2

SAY THIS TO THE CLASS "Password is an optional pair game, just for fun. Secret words come from the evolution set, the terms and the plant tree."

Set up (2 minutes)

1. Before class, copy the card page one-sided and fold and tear it into four cards, one card per round. Hand each pair only the current round's card; pairs keep each used card and add the four round totals at the end.
2. Partner A is the clue giver in rounds 1 and 3, Partner B in rounds 2 and 4. The guesser never sees the card.
3. Rounds last 2 minutes, with 30 seconds between them to swap roles. One-word clue, then ONE guess; wrong means another clue.
4. After five clues without a right guess, the word scores 0. Say "Go" and "Stop" for each round.

Read this out

"Your clue is one word only. You may not say the secret word or any part of it. If the word is snowman, you cannot say snow or man. No gestures, no spelling, no rhymes. Break a rule and that word scores zero."

Scoring: guessed on clue 1 = 5 points, clue 2 = 4, clue 3 = 3, clue 4 = 2, clue 5 = 1. The clue giver circles the number on the card. After round 4, pairs add their round totals. Highest total wins.

Words marked (calm) or (team), here and on the cards, come from today's calm block or team task. If the class skipped that block, pairs leave them out (and any round left empty).

Referee calls

Two words glued together ("sunlight") count as one clue only if they make a real word. No plurals or "-ing" forms of the secret word. A disputed clue scores zero. Each example clue below is allowed, and a good first clue.

Timing (15 minutes)

0:00	2:00	4:30	7:00	9:30	12:00
Set up, rules	Round 1, Partner A	Round 2, Partner B	Round 3, Partner A	Round 4, Partner B	Add totals, winners

Round 1: Partner A gives clues

WHALE	example clue: ocean
FLIPPER	example clue: swim
EMBRYO	example clue: early
FORELIMB	example clue: arm
TAIL	example clue: wag

Round 2: Partner B gives clues

WRIST	example clue: hand
LAYERS	example clue: rock
GORILLA	example clue: jungle
PERCENT	example clue: hundred
ANCESTOR	example clue: family

Round 3: Partner A gives clues

STRATUM (calm)	example clue: sediment
ANALOGOUS (calm)	example clue: similar
TAXONOMY (calm)	example clue: naming
LINEAGE (calm)	example clue: descent
PHYLOGENY (calm)	example clue: branching

Round 4: Partner B gives clues

MOSS (team)	example clue: damp
FERN (team)	example clue: fronds
PINE (team)	example clue: cone
FLOWER (team)	example clue: petals
ALGA (team)	example clue: pond

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Game, Day 4: Classroom Millionaire

Sub script and the 12 questions. 15 minutes at the end of the period, or for extra time. Optional.

Game · Day 4

SAY THIS TO THE CLASS

"If there is time at the end, you can play Classroom Millionaire, an optional and fun climb up twelve questions as one class. Every question comes from today: the electric charge reading, the electricity terms and the charged bead notebook."

How it works

1. Tape up a one-sided copy of the ladder page. The whole class is one player. Pick a student for the hot seat (a new student for every question).
2. Read the question and the four options, then read the options again. The hot seat may listen to quiet advice, then says "final answer" and a letter.
3. Right: the class climbs one rung. Before hearing the next question, the class may vote to walk away and keep what it has.
4. Wrong: the climb ends. Rungs 4 and 8 are safe: the class keeps the last safe amount it passed.
5. Time left over? Play the questions again as a team quiz.

Three lifelines (one use each)

Ask the class: everyone shows 1, 2, 3 or 4 fingers at once for A, B, C or D. The hot seat looks, then decides.

50/50: read out the two wrong options listed under the question. Cross them off.

Phone a friend: the hot seat picks one classmate, who has 30 seconds to say what they think out loud.

"Only the hot seat's final answer counts. Shout an answer and the class loses a lifeline."

Items marked (calm) or (team) come from today's calm block or team task: leave them out if the class did not do that block.

Rungs 1 to 4, rung 4 is safe

1. $100 In what unit is electric charge measured?
A. Volts B. Coulombs C. Newtons D. Amperes
Answer: B. Coulombs (50/50 removes C and D)

2. $250 What stores charge for a camera flash? (calm)
A. Fuse B. Resistor C. Electrode D. Capacitor
Answer: D. Capacitor (50/50 removes A and C)

3. $500 In a solid, which particles move to carry charge?
A. Protons B. Neutrons C. Electrons D. Nuclei
Answer: C. Electrons (50/50 removes B and D)

4. $1,000 Two beads push apart. What are they? (team)
A. Neutral B. Like charged C. Unlike charged D. Metal
Answer: B. Like charged (50/50 removes A and D)

Rungs 5 to 8, rung 8 is safe

5. $2,500 Which of these materials is an insulator?
A. Copper B. Silver C. Aluminum D. Glass
Answer: D. Glass (50/50 removes A and B)

6. $5,000 Which part melts if too much current flows? (calm)
A. Fuse B. Spark C. Ohm D. Capacitor
Answer: A. Fuse (50/50 removes B and C)

7. $10,000 Which way of charging needs no touching?
A. Friction B. Contact C. Heating D. Induction
Answer: D. Induction (50/50 removes A and C)

8. $25,000 Does a pull alone prove a bead is charged? (team)
A. Yes B. No C. If metal D. If heavy
Answer: B. No (50/50 removes C and D)

Rungs 9 to 12

9. $50,000 What giant flow of charge happens in and around storm clouds? (calm)
A. Lightning B. Thunder C. Resistor D. Electrode
Answer: A. Lightning (50/50 removes C and D)

10. $100,000 Double the distance: the force becomes?
A. Double B. Half C. One quarter D. Four times
Answer: C. One quarter (50/50 removes A and D)

11. $500,000 Gravity only attracts. What else can the electric force do?
A. Repel B. Bend light C. Make mass D. Stop time
Answer: A. Repel (50/50 removes C and D)

12. $1 MILLION Two protons: electric force is how many times gravity?
A. Ten B. A million C. 10 to the 36th D. 10 to the 100th
Answer: C. 10 to the 36th (50/50 removes A and B)

If the class misses

Wrong on rung 1 to 4	**class keeps $0**
Wrong on rung 5 to 8	**class keeps $1,000**
Wrong on rung 9 to 12	**class keeps $25,000**
Walk away before a question	**class keeps the amount of the last rung it climbed**

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Science Set 5: The Sun in Numbers and Element Origins

Science · Day 5

Show each calculation. Then sort the elements by where they were made.

3. **Mars is about 228,000,000 km from the Sun on average, and light travels about 300,000 km each second. How many seconds does sunlight take to reach Mars? About how many minutes is that?**

4. **At about 4,000,000 metric tons each second, how much mass does the Sun turn into energy in one day (86,400 seconds)?**

5. **Name the two stages the Sun will go through after it runs out of hydrogen to fuse in its core, in order.**

Where were these elements made?

Write each element under the place the reading says it was mostly made.

gold · helium · carbon · uranium · oxygen · hydrogen · iron

The Big Bang	Fusion inside stars	Supernovae and neutron star collisions

6. **Noemi says the iron in her blood was made on Earth. Use the reading to explain where it was made.**

Evidence from the reading

7. **Which sentence from the reading best supports the claim that the universe was once much hotter?**
   - (A) "Stars are element factories"
   - (B) "Astronomers measure galaxy distances in megaparsecs"
   - (C) "in 1965 Arno Penzias and Robert Wilson discovered the cosmic microwave background, a faint glow of microwaves from every direction, the cooled leftover of the early hot universe"
   - (D) "The Sun is a star, a huge ball of hot gas that formed about 4.6 billion years ago"
8. **Which sentence from the reading best explains where the Sun's energy comes from?**
   - (A) "Fusion turns a little mass into a lot of energy"
   - (B) "The Sun is a little less than halfway through its life"
   - (C) "That energy works its way out and leaves as light"
   - (D) "The universe itself began about 13.8 billion years ago"

☆ **Challenge** One megaparsec is about 3.26 million light-years. About how many light-years away is a galaxy 100 megaparsecs away?

Light-years: .....

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Thank you! If this works for your class, a quick review helps other teachers find it and gives you TpT credits.



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