

Middle School Science Long-Term Sub Plans, 4 Weeks

Four complete week binders of middle school science, grades 6 to 8. One topic a day on paper, solo work and a team task, a "say this" script for every task.

PREVIEW

What is included

- Four week binders (68, 66, 66, 66 pages): 266 pages
- 52 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
- 40 solo blocks (20 science sets, 20 calm blocks) and 20 team tasks for groups of four
- A "say this to the class" script for all 84 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 standards it practices
- 20 optional games, each on that day's lessons
- Answer keys for everything; color and ink-saver B&W, US Letter and A4

How it works

1. Leave the four 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 20 days: a science set, a team task and a game

- **Week 1, days 1 to 5. Science:** Density and Why Things Float; States of Matter; Food Chains and Webs; Forces and Motion; The Water Cycle. **Team:** The Size Scale Hallway, The Lab Week Plan, Paper Helicopter Test, Trout Stream Council, The Mars Crew Debate.
- **Week 2, days 6 to 10. Science:** Atoms and Molecules; Cells; Rocks and the Rock Cycle; Kinetic and Potential Energy; Engineering Design: Criteria and Constraints. **Team:** The Mystery Molecule Files, Is It Alive? The Museum Card Sort, The Quartz Grain's Journey, The Energy Olympics, The Paper Tower Challenge.
- **Week 3, days 11 to 15. Science:** Chemical Reactions; Body Systems; Plate Tectonics; Waves: Sound and Light; Ecosystem Interactions. **Team:** Kitchen Chemistry Sort, The Oxygen Trip, The Plate Boundary Map, Quiet Room Design, Ripple Effects.
- **Week 4, days 16 to 20. Science:** The Periodic Table and Properties; Genetics and Heredity; Weather and Climate; Electricity and Magnetism; Photosynthesis and Respiration. **Team:** The Mixed-Up Sample Jars, The Dragon Egg Hatchery, The Forecast Desk, The Maglev Model, The Sealed Jar Habitat.

Optional game every day, on that day's lessons: 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 266 pages.
What the sub gets: a note that explains the routine, a "say this" script for every task (84 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 6 to 8 · 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; the important information page and the class list are for the teacher (or you) to fill in. 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 names the Next Generation Science Standards (NGSS) middle school performance expectations it practices, on a small line under its title (for you, not the students). A sub plan set practices part of a performance expectation; it is review and practice, not a full assessment of it.

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 on TpT helps other teachers find it and gives you credits toward future purchases. 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** Density and Why Things Float p. 14	**Science 2** States of Matter p. 23	**Science 3** Food Chains and Webs p. 32	**Science 4** Forces and Motion p. 42	**Science 5** The Water Cycle p. 52
Early finishers or a loud moment	**Learn and Test: Matter Property Terms** p. 17	**Learn and Test: Heat and Matter Terms** p. 26	**Learn and Test: Ecosystem Terms** p. 35	**Learn and Test: Motion Terms** p. 45	**Learn and Test: Water in Nature Terms** p. 55
Block period or extra time	**The Size Scale Hallway** p. 19	**The Lab Week Plan** p. 28	**Paper Helicopter Test** p. 37	**Trout Stream Council** p. 47	**The Mars Crew Debate** p. 57
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. 40	**Classroom Millionaire** p. 50	**Mystery Box** p. 59

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: one copy per group, plus any extra copies, cards or sheets the pages ask for. Copy any page that gets torn apart (field reports, templates, 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); copy game boards and cards as their pages say.
- 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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MS SCIENCE SUB PLANS WEEK 1

Middle School Science, 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: Density and Why Things Float**	**Reviews:** density as mass divided by volume, why objects float or sink in water, and using density to identify a material. Reading and a worked example, an 8 row density table, 5 questions, a density lower, a star challenge on every page. Key included.	50	p. 14
2	**Science 2: States of Matter**	**Reviews:** the particle model of solids, liquids and gases, melting and boiling points, and reading a heating curve. Particle model reading and drawing, a melting and boiling point table, a heating curve with 6 questions, a star on every page. Key included.	50	p. 23
3	**Science 3: Food Chains and Webs**	**Reviews:** producers, consumers and decomposers, reading a food web, energy flow at about 10 percent per level, and what happens when a species disappears. Reading and vocabulary, a printed meadow food web to classify, 8 web questions, an energy flow table, a star on every page. Key included.	50	p. 32
4	**Science 4: Forces and Motion**	**Reviews:** balanced and unbalanced forces, finding the net force, speed equals distance divided by time, and reading a distance and time graph. Reading on forces and speed, 6 net force diagrams, an 8 row speed table, a distance and time graph, a star on every page. Key included.	50	p. 42
5	**Science 5: The Water Cycle**	**Reviews:** evaporation, transpiration, condensation, precipitation, runoff and infiltration, the roles of the sun and gravity, and rainfall data. Reading and a term match, a water cycle diagram to label, a rainfall table with 6 questions and a bar graph, a star on every page. 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 Science Myth or Fact.	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				
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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

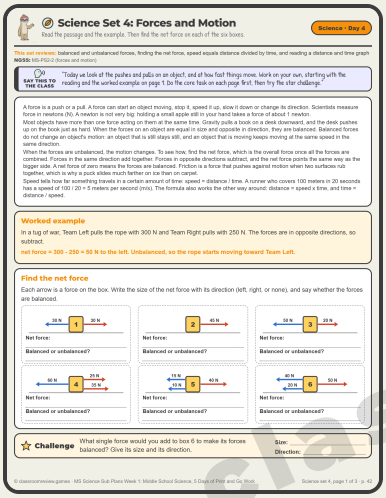
Notes / stars of the day: _____

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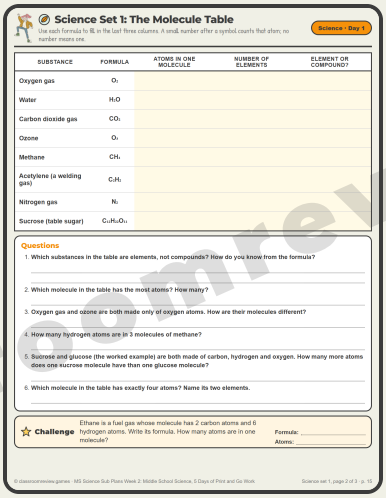
Binder cover, important information, schedule, set index, class list, how it went

ONE PAGE OF EVERY DAILY PART

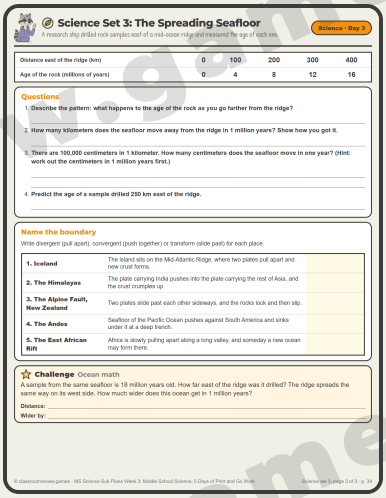
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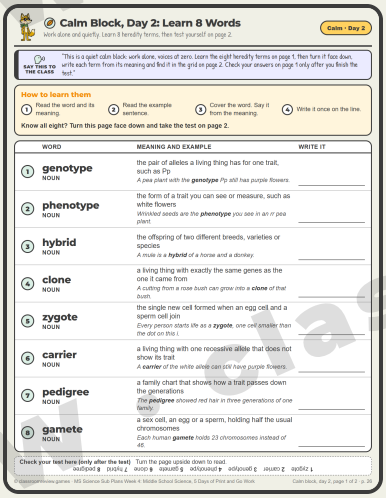
Science set: the lesson, Week 1 (solo)



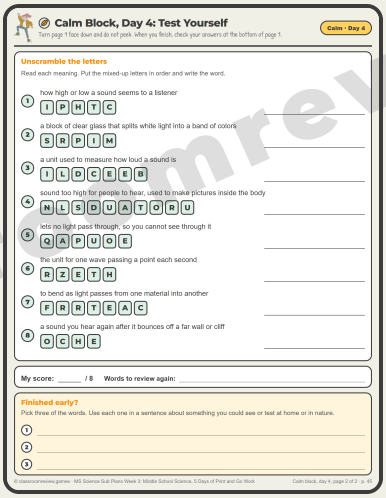
Science set: practice, Week 2 (solo)



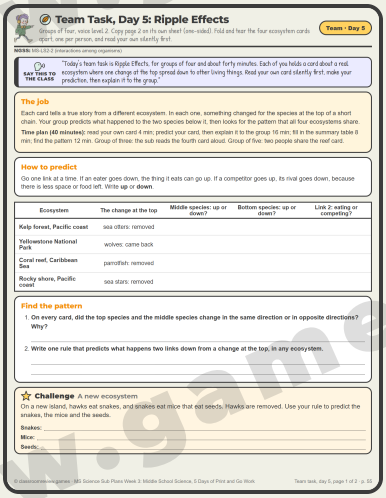
Science set: the third page (solo)



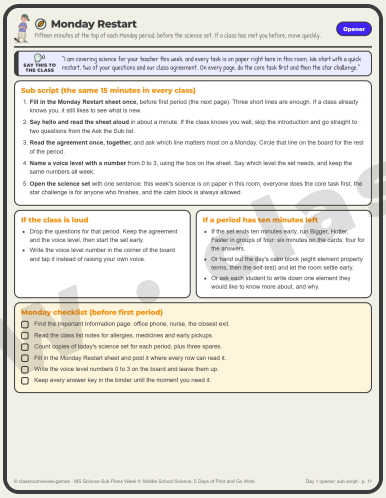
Calm block: learn 8 terms (solo)



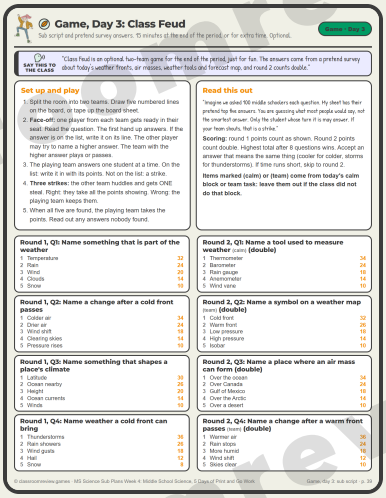
Calm block: test yourself (solo)



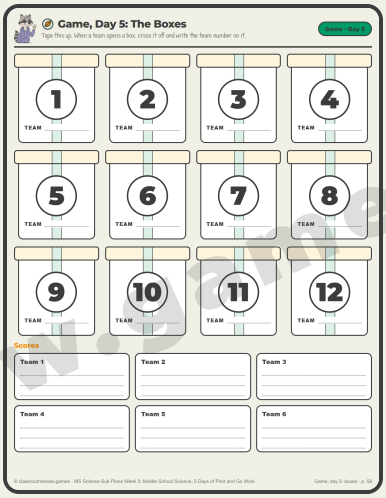
Team task (groups of four)



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: The Periodic Table and Properties

Read the passage carefully. Every answer on this page can be found in it.

Science · Day 1

This set reviews: atoms and elements, the periodic table, metals and nonmetals, atoms in molecules, and properties before and after a reaction
NGSS: MS-PS1-1 (atoms and molecules), MS-PS1-2 (properties of substances)

SAY THIS TO THE CLASS "Today we look at the elements, the building blocks of everything, and at how scientists sort them by their properties. Start with the reading on page 1, then answer the questions under it. Do the core task on each page first, then try the star challenge."

Everything around you, from the air you breathe to the desk you sit at, is made of atoms. An element is a pure substance made of only one kind of atom. So far, 118 elements have been discovered and named. Each one has a symbol of one or two letters, such as O for oxygen and Fe for iron (from ferrum, the Latin word for iron). Every atom of an element has the same number of protons in its center, and that number is the element's atomic number. Every carbon atom has 6 protons, so the atomic number of carbon is 6.

The periodic table lists the elements in order of atomic number. Its rows are called periods and its columns are called groups. Elements in the same group have similar properties. For example, lithium, sodium and potassium in group 1 are soft metals that react strongly with water. Neon, argon and the other noble gases in group 18 hardly react with anything.

Most elements are metals, on the left side and in the middle of the table. Metals are usually shiny, conduct electricity and heat well, and can be bent or hammered into new shapes. Nonmetals sit on the right side. They are usually dull, and the solid ones break apart easily when hammered. Most nonmetals conduct electricity poorly, and many of them are gases at room temperature.

Atoms can join together. A water molecule (H_2O) is made of 2 hydrogen atoms and 1 oxygen atom. Some substances do not form separate molecules: in table salt (NaCl), sodium and chlorine particles line up in a repeating pattern called an extended structure. When substances react, their atoms rearrange into new substances with new properties. Sodium is a soft, shiny metal and chlorine is a yellow-green, poisonous gas, yet together they make table salt, white crystals you can eat. Comparing properties before and after is how scientists tell that a chemical reaction has happened.

Quick check

Oxygen's atomic number is 8. How many protons are in every oxygen atom? _____

What are the rows of the periodic table called? _____

Find the evidence

Circle the letter of the sentence that best supports the idea.

1. **Which sentence from the reading best supports the idea that elements in the same group behave alike?**
   - (A) "So far, 118 elements have been discovered and named."
   - (B) "For example, lithium, sodium and potassium in group 1 are soft metals that react strongly with water."
   - (C) "The periodic table lists the elements in order of atomic number."
   - (D) "Atoms can join together."
2. **Which sentence from the reading best supports the claim that a chemical reaction makes a new substance?**
   - (A) "Most elements are metals, on the left side and in the middle of the table."
   - (B) "Most nonmetals conduct electricity poorly, and many of them are gases at room temperature."
   - (C) "Some substances do not form separate molecules: in table salt (NaCl), sodium and chlorine particles line up in a repeating pattern called an extended structure."
   - (D) "Sodium is a soft, shiny metal and chlorine is a yellow-green, poisonous gas, yet together they make table salt, white crystals you can eat."

Challenge An unknown element is shiny, bends without breaking and conducts electricity well. Is it a metal or a nonmetal? Where on the periodic table would you look for it?

Metal or nonmetal: .....

Where: .....

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Science Set 1: The Element Data Table

Use the rule to fill in the last two columns for every element. A minus sign means below zero.

Science · Day 1

The rule

At 20 °C a substance is a solid if 20 is below its melting point, a liquid if 20 is between its melting point and its boiling point, and a gas if 20 is above its boiling point. An element that is shiny and conducts electricity is a metal; one that is neither is a nonmetal.

Element	Atomic number	Melting point (°C)	Boiling point (°C)	Shiny?	Conducts electricity?	State at 20 °C	Metal or nonmetal?
Copper (Cu)	29	1,085	2,562	yes	yes		
Bromine (Br)	35	-7	59	no	no		
Neon (Ne)	10	-249	-246	no	no		
Mercury (Hg)	80	-39	357	yes	yes		
Sulfur (S)	16	115	445	no	no		
Sodium (Na)	11	98	883	yes	yes		
Oxygen (O)	8	-219	-183	no	no		
Iron (Fe)	26	1,538	2,861	yes	yes		

Questions

1. **Which elements in the table are liquids at 20 °C? Is each one a metal or a nonmetal?**

2. **Which element in the table comes first on the periodic table, and which comes last? How do you know?**

3. **On a polar night the air is -50 °C. What is the state of mercury at that temperature? Explain with the table.**

4. **The liquid range is the boiling point minus the melting point. Which element has the widest liquid range? Which has the narrowest?**

5. **Sodium and iron are both metals. Which one melts at a lower temperature, and by how many degrees?**

☆ Challenge

Gallium is a shiny metal that melts at about 30 °C. Is it a solid or a liquid in a 20 °C room? What would happen to a piece of it in a warm hand (about 37 °C)?

In the room: .....

In a hand: .....

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Science Set 1: Atoms In, New Substances Out

Part 1: count the atoms and draw each molecule. Part 2: compare the properties before and after.

Science · Day 1

Part 1: Count the atoms

A small number after a symbol tells how many atoms of that element are in one molecule. No number means 1 atom. Draw each molecule as circles, one circle per atom, with the symbol inside.

Formula	Substance	Atoms of each element	Total atoms	Draw it
H_2O	water			
CO_2	carbon dioxide			
O_2	oxygen gas			
C_2H_6	ethane			
CH_4	methane			

Symbols: H = hydrogen, C = carbon, O = oxygen.

Part 2: Before and after

Sodium and chlorine react. Here are their properties before, and the properties of the substance they make.

Property	Sodium (before)	Chlorine (before)	Sodium chloride (after)
Color	silvery white	yellow-green	white
State at 20 °C	solid	gas	solid
Melting point	98 °C	-101.5 °C	801 °C
Conducts electricity as a solid?	yes	no (a gas)	no

1. **Name two properties that changed. Give the values before and after.**

2. **Did a chemical reaction happen? Use the data as your evidence.**

3. **A spoonful of salt is stirred into water until it disappears. When the water dries up, the same white salt crystals are left, with the same melting point. Is this a chemical reaction? Why or why not?**

Challenge Glucose, a sugar, has the formula $C_6H_{12}O_6$. How many atoms are in one glucose molecule? How many different elements?

Atoms: .....

Elements: .....

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Answer Keys (1 of 8)

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

Day 1 opener: Bigger, Hotter, Faster, answers

1. B (a lightning bolt). Lightning heats the air to about 27,000 °C (50,000 °F), about five times hotter than the Sun's surface (about 5,500 °C). **2. A (a newborn baby).** A newborn has about 300 bones; many of them grow together, so an adult has 206. **3. A (light).** Light travels about 300,000 km every second; sound in air travels only about 343 meters per second. **4. B (the distance from Earth to the Moon).** Earth is about 12,756 km across, but the Moon is about 384,400 km away: about 30 Earths would fit in the gap. **5. B (stars in our galaxy, the Milky Way).** About 8 billion people live on Earth; the Milky Way has 100 billion to 400 billion stars. **6. A (the depth of the deepest ocean trench).** The deepest point of the Mariana Trench is about 10,900 m deep; Everest is 8,849 m tall, so it would fit inside with room to spare. **7. B (the Moon).** The Moon formed about 4.5 billion years ago; the first dinosaurs lived about 230 million years ago. **8. A (a peregrine falcon in a dive).** A diving peregrine falcon can pass 300 km/h; a cheetah reaches about 112 km/h, the fastest on land.

One point for each right letter, one more for a reason that says the same thing in other words. Score: 16 points at most.

Science Set 1: The Periodic Table and Properties

Quick check: 1. 8; 2. Periods (the columns are groups). **Find the evidence:** 1. B ("For example, lithium, sodium and potassium in group 1 are soft metals that react strongly with water."); 2. D ("Sodium is a soft, shiny metal and chlorine is a yellow-green, poisonous gas, yet together they make table salt, white crystals you can eat."). **Page 1 star challenge:** a metal; on the left side or in the middle of the table.

Table (state at 20 °C, metal or nonmetal): Copper solid, metal; Bromine liquid, nonmetal; Neon gas, nonmetal; Mercury liquid, metal; Sulfur solid, nonmetal; Sodium solid, metal; Oxygen gas, nonmetal; Iron solid, metal.

Questions: 1. bromine (nonmetal) and mercury (metal); 2. Oxygen (atomic number 8) first and mercury (80) last, because the table lists the elements in order of atomic number; 3. Solid: minus 50 °C is below mercury's melting point (minus 39 °C); 4. Widest: copper, 2,562 - 1,085 = 1,477 °C; narrowest: neon, minus 246 minus minus 249 = 3 °C; 5. Sodium, 1,538 - 98 = 1,440 °C lower. **Page 2 star challenge:** solid in the room (20 °C is below its melting point of about 30 °C); in a hand it melts into a liquid (37 °C is above 30 °C).

Count the atoms: H_2O: 2 H, 1 O, 3 in all; CO_2: 1 C, 2 O, 3 in all; O_2: 2 O, 2 in all; C_2H_6: 2 C, 6 H, 8 in all; CH_4: 1 C, 4 H, 5 in all. Drawings: one circle per atom, joined (for example, H_2O is an O circle with two H circles attached).

Before and after: 1. Any two, for example: color (silvery white and yellow-green, then white); melting point (98 °C and -101.5 °C, then 801 °C); chlorine was a gas, the product is a solid. 2. Yes: the product has properties that neither starting substance has (a new color, a much higher melting point), so a new substance formed. 3. No: the salt keeps the same properties (white crystals, same melting point), so no new substance formed; it only mixed with the water and came back out. **Page 3 star challenge:** 24 atoms (6 C, 12 H, 6 O); 3 elements.

Calm block, Day 1: Learn and Test: Element Property Terms

Match: 1. semiconductor; 2. tarnish; 3. inert; 4. ductile; 5. ore; 6. corrosion; 7. brittle; 8. reactivity.

Students check their own test with the upside-down answers at the bottom of page 1 and write a score out of 8. Finished early sentences: answers vary; accept any sentence about something students could see or test at home or in nature that uses the word with its page 1 meaning.

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Calm Block, Day 1: Learn 8 Words

Work alone and quietly. Learn 8 chemical reaction terms, then test yourself on page 2.

Calm · Day 1

SAY THIS TO THE CLASS

"This block is silent work, each person with their own two pages, and it also fills any time left over. Study the eight chemical reaction terms on page 1, then flip to page 2 and match every meaning to its term. The answers are printed upside down on page 1, so look only once you are done."

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	**exothermic** ADJECTIVE	describes a reaction that gives off heat to its surroundings *A hand warmer packet gets hot because its reaction is **exothermic**.*	
2	**endothermic** ADJECTIVE	describes a reaction that takes in heat, so its surroundings get colder *The mixture gets colder as baking soda and vinegar react, so the reaction is **endothermic**.*	
3	**catalyst** NOUN	a substance that speeds up a reaction without being used up *Inside a car, a **catalyst** helps change harmful exhaust gases into safer ones.*	
4	**inhibitor** NOUN	a substance that slows down or stops a reaction *Food makers add an **inhibitor** so cooking oil goes stale more slowly.*	
5	**combustion** NOUN	a fast reaction with oxygen that gives off heat and light *The **combustion** of natural gas heats the water in many homes.*	
6	**effervescence** NOUN	the fizzing of many small gas bubbles rising out of a liquid *A tablet dropped in water makes a burst of **effervescence**.*	
7	**flammable** ADJECTIVE	catches fire and burns easily *Gasoline is **flammable**, so it is stored in sealed red cans.*	
8	**fermentation** NOUN	a process in which yeast or bacteria break down sugar, often making a gas ***Fermentation** by yeast makes bread dough puff up.*	

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

1 endothermic 2 catalyst 3 flammable 4 effervescence 5 inhibitor 6 fermentation 7 exothermic 8 combustion

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Team Task, Day 2: The Oxygen Trip

Groups of four, voice level 2. Copy page 2 on its own sheet (one-sided). Fold and tear the twelve cards apart; each person takes one row of three.

Team · Day 2

NGSS: MS-LS1-3 (body systems)

SAY THIS TO THE CLASS

"Today's team task is The Oxygen Trip, for groups of four and about forty minutes. Each of you holds three step cards, and together you rebuild the trip oxygen takes from the air to a muscle in your leg. Read your cards silently first, then decide whose card comes first."

The job

Rebuild the trip one breath of oxygen takes from the air to a working leg muscle, and how the waste gas gets back out, then show which body systems do each step. **1.** Read your cards silently. **2.** Whoever holds the first step reads it aloud. **3.** Ask: what must happen next? That card is read and laid down. **4.** Fill in the strip and the systems.

Time plan (40 minutes): read your three cards silently 4 min; find the first card and build the trip 18 min; mark the systems 8 min; group questions 10 min. Group of three: four cards each. Group of five: one checker reads the trip aloud.

The trip, in order (one card letter per box; step 1 is where the air comes in)

1	2	3	4	5	6	7	8	9	10	11	12

STEP NUMBERS	WHICH SYSTEM OR SYSTEMS DO THESE STEPS?
Steps 1 to 4	
Step 5	
Steps 6 to 8	
Steps 9 to 10	
Steps 11 to 12	

Group question

At which steps does the job pass from one system to another? Find at least two. Write the step numbers and the two systems each time.

.....

.....

Challenge Two parts

1. Race day. During a race, which steps speed up? Name two and say which system does each. Why does the whole trip need to speed up, not just one step? **2. Hand-offs.** Which card shows the step where oxygen first enters the blood? Which card shows the only step done by the muscle cells alone?

1. Two steps: .....

1. Why the whole trip: .....

2. Oxygen enters the blood: .....

2. Muscle cells alone: .....

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Game, Day 1: The Board

Tape this to the whiteboard or copy it. Cross squares off as they are played.

Game · Day 1

ELEMENTS	METALS	MOLECULES	TERMS	LAB JARS
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 "If there is time at the end, we can play Password, an optional and fun game for pairs. One partner gives one-word clues for a secret word from today's body systems lesson, and the other partner guesses."

Set up (2 minutes)

1. Before class, copy the card page one-sided and fold and tear it into four round cards. 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 ("hotdog") count as one clue only if they make a real word. No plurals or "-ing" forms of the secret word. If a pair disagrees about a clue, the word 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

WINDPIPE	example clue: throat
TISSUE	example clue: group
ORGAN	example clue: liver
LUNGS	example clue: breathe
HEART	example clue: pump

Round 2: Partner B gives clues

BLOOD	example clue: red
NERVES	example clue: brain
MUSCLE	example clue: flex
SKELETON	example clue: bones
NUTRIENTS	example clue: vitamins

Round 3: Partner A gives clues

STOMACH	example clue: food
TENDON (calm)	example clue: cord
REFLEX (calm)	example clue: blink
SALIVA (calm)	example clue: mouth
HORMONE (calm)	example clue: messenger

Round 4: Partner B gives clues

LIGAMENT (calm)	example clue: joint
TRACHEA (team)	example clue: neck
AORTA (team)	example clue: artery
DIAPHRAGM (team)	example clue: breath
VEINS (team)	example clue: return

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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 "To finish, we can play Classroom Millionaire together, an optional game just for fun with one ladder of twelve questions. The questions come from today's magnets, electromagnets, circuit terms and maglev design, and the class shares three lifelines."

How it works

1. Tape up the ladder sheet. 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 Two like magnet poles do what?
A. Attract B. Repel C. Melt D. Spin
Answer: B. Repel (50/50 removes C and D)

2. $250 Which of these does a magnet pull on?
A. Plastic B. Wood C. Iron D. Copper
Answer: C. Iron (50/50 removes A and B)

3. $500 A proton carries which kind of charge?
A. Positive B. Negative C. No charge D. Magnetic
Answer: A. Positive (50/50 removes C and D)

4. $1,000 A material that blocks electricity? (calm)
A. Insulator B. Motor C. Magnet D. Circuit
Answer: A. Insulator (50/50 removes B and C)

Rungs 5 to 8, rung 8 is safe

5. $2,500 Where a magnet's force acts is its what?
A. Pole B. Field C. Core D. Charge
Answer: B. Field (50/50 removes C and D)

6. $5,000 Trials 1 to 3: clips per 10 turns?
A. 1 B. 3 C. 6 D. 10
Answer: B. 3 (50/50 removes A and D)

7. $10,000 Which magnet made the cheapest maglev car? (team)
A. Small disc B. Medium bar C. Large block D. None
Answer: A. Small disc (50/50 removes C and D)

8. $25,000 A coil that is a magnet with current on? (calm)
A. Lodestone B. Solenoid C. Ampere D. Voltage
Answer: B. Solenoid (50/50 removes C and D)

Rungs 9 to 12

9. $50,000 Clips lifted with no iron core (trial 5)?
A. 1 B. 3 C. 6 D. 12
Answer: A. 1 (50/50 removes C and D)

10. $100,000 Track: N faces up. Car magnets: which down? (team)
A. North B. South C. Either D. Neither
Answer: A. North (50/50 removes C and D)

11. $500,000 Clips for 40 turns, 2 batteries, a nail?
A. 12 B. 18 C. 24 D. 36
Answer: C. 24 (50/50 removes A and D)

12. $1 MILLION Clips held through 1 sheet of cardboard?
A. 12 B. 8 C. 5 D. 3
Answer: B. 8 (50/50 removes A and D)

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 after rung n	**class keeps rung n**

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Science Set 3: The Spreading Seafloor

A research ship drilled rock samples east of a mid-ocean ridge and measured the age of each one.

Science · Day 3

Distance east of the ridge (km)	0	100	200	300	400
Age of the rock (millions of years)	0	4	8	12	16

Questions

1. **Describe the pattern: what happens to the age of the rock as you go farther from the ridge?**

2. **How many kilometers does the seafloor move away from the ridge in 1 million years? Show how you got it.**

3. **There are 100,000 centimeters in 1 kilometer. How many centimeters does the seafloor move in one year? (Hint: work out the centimeters in 1 million years first.)**

4. **Predict the age of a sample drilled 250 km east of the ridge.**

Name the boundary

Write divergent (pull apart), convergent (push together) or transform (slide past) for each place.

1. Iceland	The island sits on the Mid-Atlantic Ridge, where two plates pull apart and new crust forms.
2. The Himalayas	The plate carrying India pushes into the plate carrying the rest of Asia, and the crust crumples up.
3. The Alpine Fault, New Zealand	Two plates slide past each other sideways, and the rocks lock and then slip.
4. The Andes	Seafloor of the Pacific Ocean pushes against South America and sinks under it at a deep trench.
5. The East African Rift	Africa is slowly pulling apart along a long valley, and someday a new ocean may form there.

☆ Challenge Ocean math

A sample from the same seafloor is 18 million years old. How far east of the ridge was it drilled? The ridge spreads the same way on its west side. How much wider does this ocean get in 1 million years?

Distance: .....

Wider by: .....

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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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