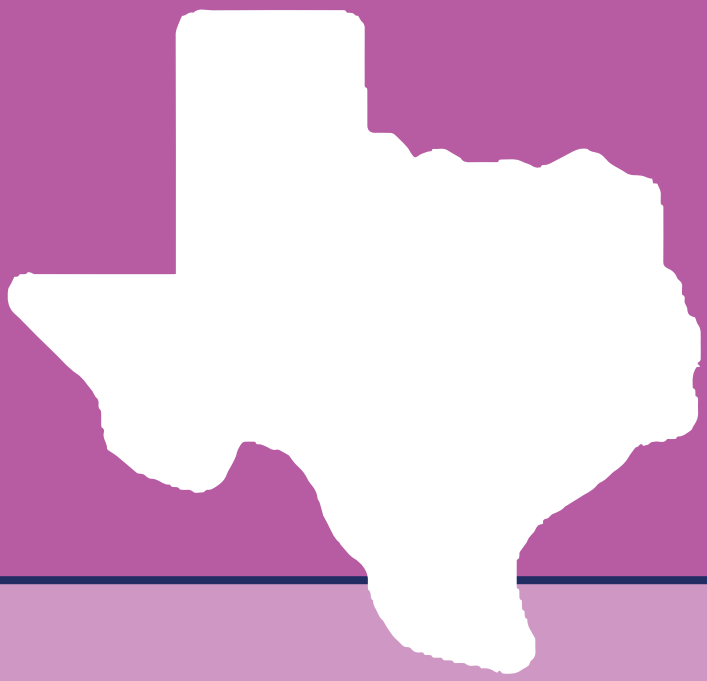
Bluebonnet Learning
K–5 Reading Language Arts

ENGLISH

CHEMICAL MATTER: DETECTIVES, DINOSAURS, AND DISCOVERY



GRADE 5 UNIT 8 | ACTIVITY BOOK

EDITION 1

Grade 5 | Unit 8

Chemical Matter:
Detectives, Dinosaurs, and Discovery

Activity Book

Acknowledgement:

Thank you to all the Texas educators and stakeholders who supported the review process and provided feedback. These materials are the result of the work of numerous individuals, and we are deeply grateful for their contributions.

Notice: These learning resources have been built for Texas students, aligned to the Texas Essential Knowledge and Skills, and are made available pursuant to Chapter 31, Subchapter B-1 of the Texas Education Code.

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Unit 8
Detectives, Dinosaurs, and Discovery
Activity Book

This Activity Book contains activity pages that accompany the lessons from the Unit 8 Teacher Guide. The activity pages are organized and numbered according to the lesson number and the order in which they are used within the lesson. For example, if there are two activity pages for Lesson 4, the first will be numbered 4.1 and the second 4.2. The Activity Book is a student component, which means each student should have an Activity Book.

ACTIVITY 1.1

NAME:_____ DATE:_____

WELCOME TO FOSSIL CAMP!

Working individually, answer the questions below in the space provided.

1. Below are three images. Which of these is closest to the setting described in the text? Provide quotes from the text to support your answer.







NAME:_____ DATE:_____

2. **Look at the sentences below.** Circle those that you think describe the setting of this text. In each case, provide a word or term in the text that supports your answer.

   "Lonely and empty"

   "An extraordinary edifice made by man"

   "Shaped by rain and storms"

   "Chains of rocky hills that have almost no plants or life on them"

   "Lush and green"

Challenge

1. The badlands are the setting for this story. Does that mean the tents are not the setting? Give reasons for your answer.

2. Why do you think the text spends so much time describing the setting? What effect does that have on you, the reader?

ACTIVITY PAGE 1.2

NAME: _____ DATE: _____

VOCABULARY

Working as a class, complete the table below, using Chapter 1 of *The Badlands Sleuth* for your answers.

TERM OR IDEA	DEFINITION OR EXPLANATION
Matter	
States of Matter	
Physical Property	
Mass	

ACTIVITY PAGE 1.2

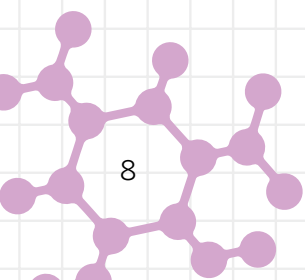
NAME: _____ DATE: _____

EXAMPLES FROM TEXT	OTHER EXAMPLES

ACTIVITY PAGE 1.3

NAME: _____ **DATE:** _____

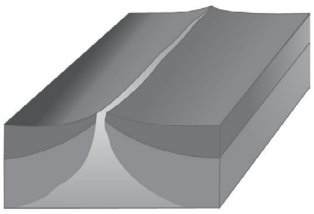
Think of an object that qualifies as matter. Using the table you created in Activity Page 1.2 as a guide, describe the properties of the object, just as a scientist would. But don't name or identify the object! As you write, think about how to organize your information.



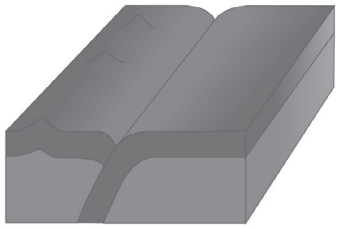
THE CHANGING EARTH–GEOLOGY READER

A Matter of Time

At some boundaries, tectonic plates are moving apart. As the plates separate, molten rock flows up from the mantle into the space between them, forming new crust. Mid-ocean ridges are an example of this type of plate interaction. Tectonic plates along the mid-ocean ridge in the Atlantic Ocean are moving apart at a rate of about 0.8 to 2 inches per year. That may not seem like much, but it adds up. Two hundred million years ago, the landmasses of North America and Europe were joined. So were South America and Africa. Thanks to separating plates, these continents now lie on opposite sides of a vast ocean.

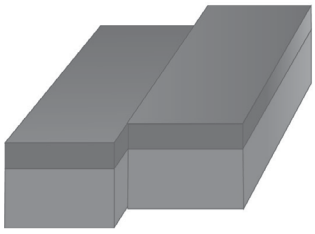


Tectonic plates move apart.



Tectonic plates collide.

At other plate boundaries, tectonic plates are colliding, or crashing together. In some places, colliding plates slowly crash into each other. The crust at their edges gradually crumples and is pushed higher and higher, causing mountains to form. In other places, one of the colliding plates slides under the other. Two plates are colliding this way along the western coast of South America. A heavier oceanic plate is sliding under a lighter continental plate. Scientists call this process subduction. Subduction has created a deep ocean trench off the coast of Chile and Peru. It has also had a role in causing the towering Andes Mountains along the western edge of South America to form. Similar plate interactions have formed mountain ranges throughout Earth's long history.



Tectonic plates slide sideways past one another.

Finally, tectonic plates slide sideways past one another. It's never a smooth process. Plate edges press together hard. They often get stuck while the

20

pressure keeps building. Eventually the pressure gets too great. The stuck edges break free, causing the plates to jerk past each other.

Providing the Answers

The theory of plate tectonics answered many questions in geology. It explained how Wegener's Pangaea broke apart. It explained how the continents have been slowly rearranged over an estimated 240 million years. The movement of the plates also explained mid-ocean ridges, deep ocean trenches, patterns in the locations of mountains, and many other features on Earth's surface. The theory has become the cornerstone of modern geology.

As plates move, interesting things happen. Most of the time, they happen incredibly slowly. Sometimes, though, the effects of plate movements are sudden and dramatic. Think earthquakes and volcanoes!

Core Conclusions



You may never have heard of the Danish scientist Inge Lehmann. Among seismologists, however, she is famous. Around 1900, scientists thought the earth had just three layers: an outer crust, a solid mantle, and a liquid core. Lehmann studied seismograph records of earthquakes. She analyzed how seismic waves changed as they traveled through Earth's interior. Lehmann collected thousands of records organized in boxes—there were no computers back then! She saw patterns in how seismic waves behaved as they moved through Earth. Lehmann concluded that Earth's core has two parts: a liquid outer core and a solid inner core. In 1936, she announced her findings and changed our view of Earth!

ACTIVITY PAGE 2.1

NAME: _____ **DATE:** _____

Look again at the second half of Chapter 1 of *The Badlands Sleuth*. In your pairs, compare this text with the *Geology* text and provide reasons why you might consider *The Badlands Sleuth* text either informational or literary. Give specific examples in your answer.

Reasons the Text Is Informational Like the *Geology* Text

Like the *Geology* text, it: _____

_____

_____

_____

For example: _____

_____

_____

Unlike the first half of Chapter 1 of *The Badlands Sleuth*, it:

_____

_____

_____

For example: _____

_____

_____

ACTIVITY PAGE 2.1

NAME: _____ **DATE:** _____

Reasons the Text Is Literary Like the First Half of the Chapter

Like the first half of the chapter, it: _____

_____

_____

_____

For example: _____

_____

_____

Unlike the *Geology* text, it: _____

_____

_____

_____

For example: _____

_____

_____

NAME: _____ DATE: _____

Which Is It?

Do you think this text should be classed as narrative or informational? Use your examples above to provide an answer. (If you disagree with your partner, it is OK for you to write something different.)

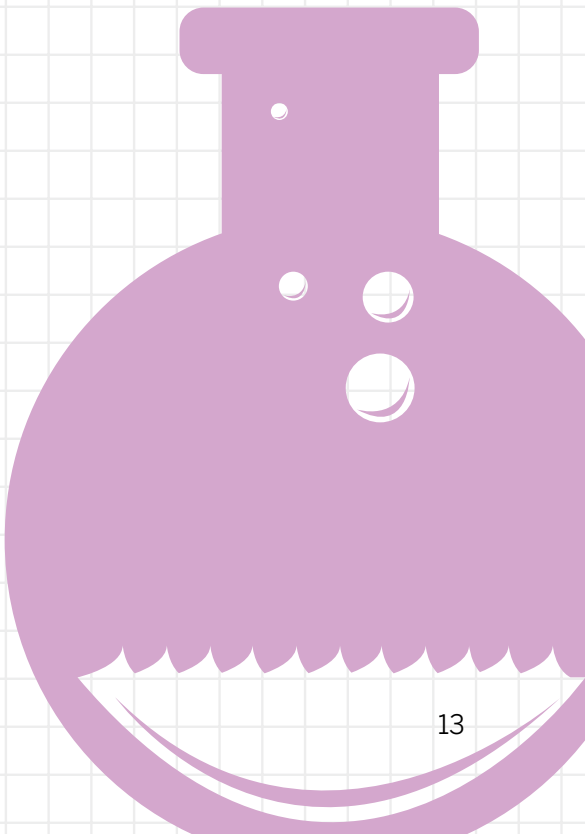
_____

_____

_____

_____

_____



ACTIVITY PAGE 2.2

NAME: _____ **DATE:** _____

WRITE A NARRATIVE CONTAINING INFORMATIONAL CONTENT

Your task is to rewrite the Geology content in Activity Page 1.3 in the narrative form of *The Badlands Sleuth*.

AS YOU WRITE, YOU SHOULD CONSIDER:

- The characteristics of the text you identified the previous day. What does the "narrative form" of *The Badlands Sleuth* mean?
- The content. Although you are rewriting in narrative form, the content must still be accurate and clear.
- What you need to include. You cannot copy and paste all the information—you should choose what to present and how, while explaining the main ideas in the text.
- Your setting and plot. Be as imaginative as you like! If you wish, you can also use devices from *The Badlands Sleuth*—for example, the author used questions from the campers to provide a context for the information Tess provides.
- You should plan out your work for at least five minutes before you write—think about the organization of the text and your plot!

ACTIVITY PAGE 2.2

NAME: _____ **DATE:** _____

ACTIVITY 2.3

NAME: _____ DATE: _____

EXPAND THE SENTENCES

Expand the sentences below. Think about descriptive details you can add, and what additional information they will provide the reader. You might want to brainstorm some adjectives first. Remember, you should still have only one sentence at the end.

1. Amy walked into her tent.

_____

_____

_____

2. Matt listened to Tess's explanation.

_____

_____

_____

3. I drove round the rocks.

_____

_____

_____

NAME:_____ DATE:_____

-ment: Suffix Meaning State Of Being

Choose the correct word and combine it with the suffix *–ment* to complete the sentence.

1. Winning the Nobel Prize was a great _____.
   (amaze, achieve, align, excite)

2. The idea of finding a new fossil caused great _____.
   (disagree, judge, entertain, excite)

3. After 45 years of work, Mr. Smith was looking forward to _____.
   (pay, accomplish, move, retire)

4. I want to be a police officer because I'm interested in

   law _____.
   (endear, encourage, enforce, entertain)

5. With a glow of _____ in his eyes, Matt ran down the beach.
   (achieve, align, excite, entertain)

Challenge:

Write three sentences using a word with the suffix *–ment*. They can be about anything!

_____

_____

_____

ACTIVITY 2.5

NAME:_____ DATE:_____

ANALYZE DETAILS

In pairs, answer the questions below. After answering each question, say whether you think the text detail is literary or informational, and why.

Question	Answer	Is this a literary or informational detail? Give reasons for your answer.
What series of steps are required to excavate the bones?		
What clue do you get about Julian's personality from his questions?		
Why does Daria say she wants her phone, and why does she really want it?		

ACTIVITY 3.1

NAME:_____ DATE:_____

Can you be a dinosaur detective?

Read the clues below and see if you can decipher the origin of the dinosaur's name.

- Acheroraptor temertyorum was found in Hell's Creek in Montana.
- In Greek mythology, there is a river in the underworld called Acheron. The Greeks did not have hell–but they did have the underworld, where people were punished or rewarded depending on their lives.
- Raptor comes from the Latin word raptere, which means "to plunder or steal."
- James and Louise Temerty have been major supporters of the University of Ontario, where the dinosaur is displayed.
- Sometimes paleontologists, or those who supported or funded their work, get new fossils named after them.

My Hypothesis

1. They used the name **Acheroraptor** because

_____

_____

_____

2. They used the name **temertyorum** because

_____

_____

_____

NAME: _____ DATE: _____

THE WATER CYCLE

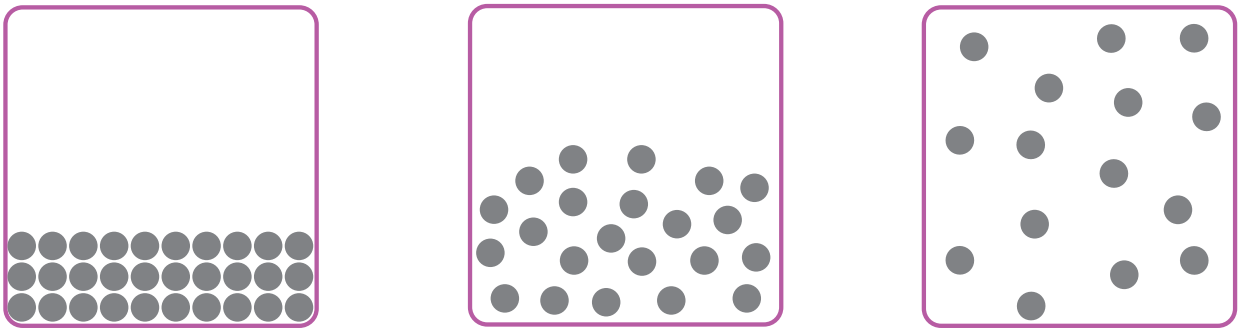
The diagram shows a water cycle–which describes how water moves around the earth in different states.

Using the content from the Reader, and the diagrams on the following page:

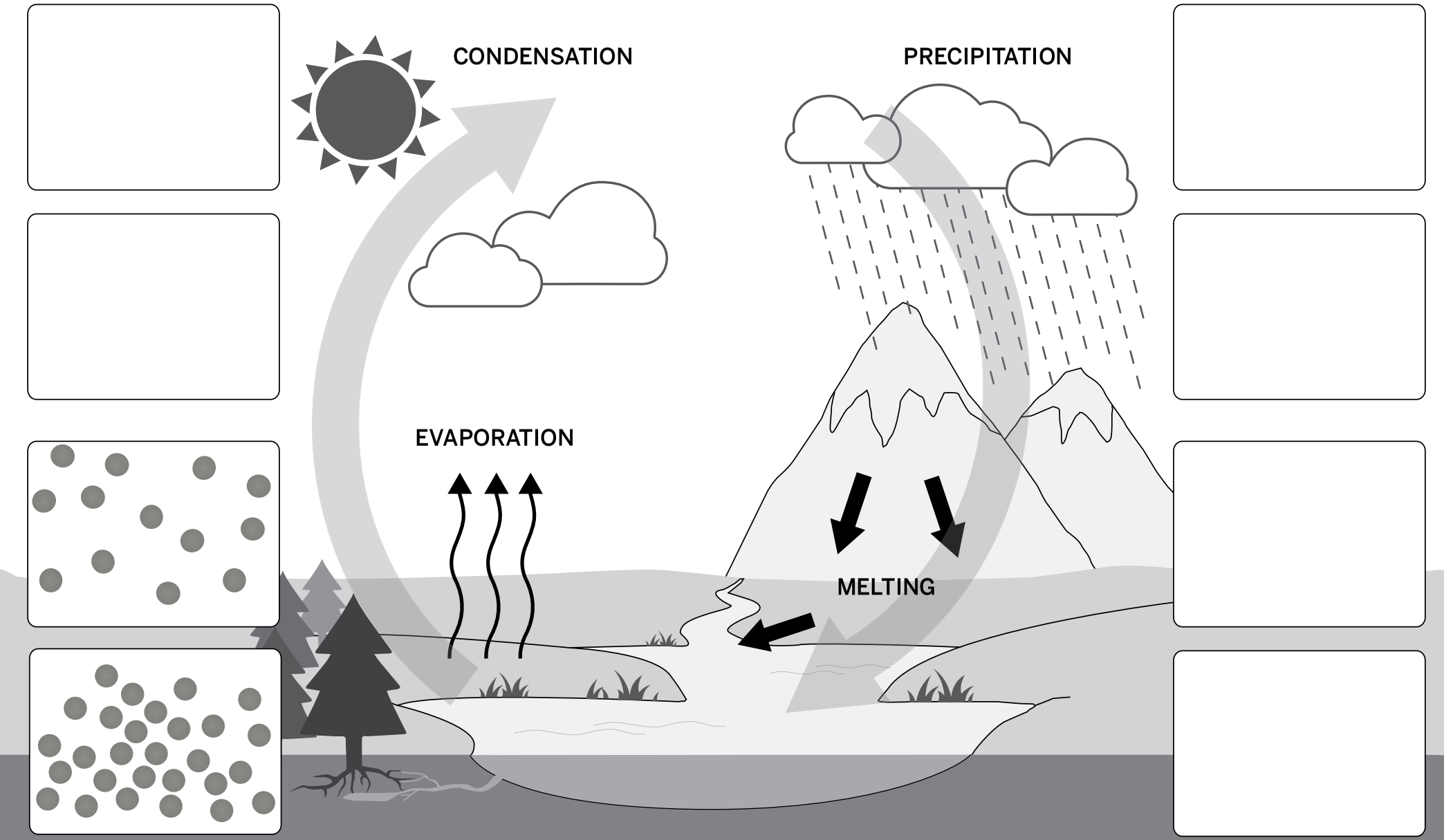
1. Annotate this diagram by describing how water changes state through the cycle.
2. Draw the appropriate diagrams next to each part of the water cycle to show the changes in state. Draw arrows between them to show the change that is occurring.

The first example has been completed for you.

STATE CHANGES



SOLID **LIQUID** **GAS**


CONDENSATION
PRECIPITATION
EVAPORATION
MELTING

ACTIVITY 3.3

NAME:_____ DATE:_____

CHARACTER MAPS

AMY

NAME:_____ DATE:_____

AMY

ACTIVITY 3.3

NAME: _____ DATE: _____

TESS

NAME:_____ DATE:_____

TESS

ACTIVITY 3.3

NAME:_____ DATE:_____

JULIAN

NAME:_____ DATE:_____

JULIAN

ACTIVITY 3.3

NAME:_____ DATE:_____

KRISTAL

NAME:_____ DATE:_____

KRISTAL

ACTIVITY 3.3

NAME: _____ DATE: _____

DARIA

ACTIVITY 3.3

NAME:_____ DATE:_____

DARIA

ACTIVITY 3.3

NAME:_____ DATE:_____

FELIX

NAME:_____ DATE:_____

FELIX

ACTIVITY 3.3

NAME:_____ DATE:_____

SQUIRRELS

NAME:_____ DATE:_____

SQUIRRELS

ACTIVITY 3.3

NAME:_____ DATE:_____

SUV

NAME: _____ DATE: _____

SUV

NAME: _____ DATE: _____

TESS'S RULES FOR OBSERVATION

When I started studying chemistry, the first thing I had to learn was how to notice things properly. My rules for observation are:

1. Look carefully at everything.
2. Record what you can: mass, color, texture, state.
3. Look at how things change. If you heat it up, what happens? If you add another substance, what happens?
4. Ask, "Does what I observe match the theory?" Great scientific discoveries happen when scientists notice things not behaving the way they thought those things would. Do you see anything strange?
5. If you have a theory, test it across as many examples as you can. The more evidence you have to back up your ideas, the better.

TRY APPLYING THE RULES TO THIS EXAMPLE:

If I wanted to understand the properties of salt, I would

_____

_____

_____

INSPECTOR ELLIS'S RULES FOR DETECTION

There's a reason I'm Amy's favorite detective. I am brilliant. No case goes unsolved if Inspector Ellis is called in (well, there was that one case with the umbrella and the penguin, but I don't like to talk about it).

Obviously, you can't become as brilliant as I am (Did I mention I was brilliant?) overnight. But you can start down the long, lonely path of becoming a great detective by following my rules of observation.

1. Look at everything. Write down what you see.

2. Collect what you can and analyze it—fingerprints, lipstick stains, everything (you can send it to the chemistry people in the lab).

3. If you've seen the crime scene before, compare what you see now with what you saw before.

4. Does anything seem out of place or unusual?

5. Interview everyone. Do their stories match up? Does anything seem out of place?

6. Is anyone behaving strangely? You can't arrest someone for being nervous, but it might give you an idea of what to look for and where.

7. Do you have a theory? Can you test it? For example, in my last case, I thought it was possible the thief had stolen out through an air vent. I tested if this was possible by sending my sidekick through the vent. I was wrong, and my sidekick became stuck, but I'd never have known this without testing my theory! (He quit later; some people can't cope with the challenge of this job.)

ACTIVITY 4.1

NAME: _____ DATE: _____

As you read Chapter 3 in your pairs, one of you should answer the Detective questions below, and the other the Scientist questions. When you have finished, explain and discuss your answers with your partner.

Detective Questions:

1. What are we told about Dr. Forester that indicates she isn't "very happy"?

2. What did Kristal do that indicated she was "secretive" about her drawings?

3. What further evidence do we have that Dr. Forester is upset?

Challenge: Why does this suggest she is upset?

4. What information have we been given about Amy that tell us why she "tingles" when she hears the word *mystery*?

NAME: _____ DATE: _____

SCIENTIST QUESTIONS:

1. How was matter defined in earlier chapters?

_____

_____



SUPPORT:

The answer is in the second half of Chapter 1.

2. How has Tess added to the definition of matter?

_____

_____

3. What are different kinds of atoms called?

_____

_____

4. How do scientists organize information about each element?

_____

_____

ACTIVITY PAGE 4.2

NAME: _____ **DATE:** _____

PART 1.

Working in your small groups, find each of the elements mentioned by Tess on page 19 of the Reader in the periodic table. Note their chemical symbols and circle them in the periodic table below.

Periodic Table of the Elements

	1 1A	2 2A	3 3B	4 4B	5 5B	6 6B	7 7B	8	9 8B	10
1	1 **H** Hydrogen 1.008									
2	3 **Li** Lithium 6.94	4 **Be** Beryllium 9.0122								
3	11 **Na** Sodium 22.990	12 **Mg** Magnesium 24.305								
4	19 **K** Potassium 39.098	20 **Ca** Calcium 40.078	21 **Sc** Scandium 44.956	22 **Ti** Titanium 47.867	23 **V** Vanadium 50.942	24 **Cr** Chromium 51.996	25 **Mn** Manganese 54.938	26 **Fe** Iron 55.845	27 **Co** Cobalt 58.933	28 **Ni** Nickel 58.693
5	37 **Rb** Rubidium 85.468	38 **Sr** Strontium 87.62	39 **Y** Yttrium 88.906	40 **Zr** Zirconium 91.224	41 **Nb** Niobium 92.906	42 **Mo** Molybdenum 95.95	43 **Tc** Technetium	44 **Ru** Ruthenium 101.07	45 **Rh** Rhodium 102.91	46 **Pd** Palladium 106.42
6	55 **Cs** Cesium 132.91	56 **Ba** Barium 137.33	71 **Lu** Lutetium 174.97	72 **Hf** Hafnium 178.49	73 **Ta** Tantalum 180.95	74 **W** Tungsten 183.84	75 **Re** Rhenium 186.21	76 **Os** Osmium 190.23	77 **Ir** Iridium 192.22	78 **Pt** Platinum 195.08
7	87 **Fr** Francium	88 **Ra** Radium	103 **Lr** Lawrencium	104 **Rf** Rutherfordium	105 **Db** Dubnium	106 **Sg** Seaborgium	107 **Bh** Bohrium	108 **Hs** Hassium	109 **Mt** Meitnerium	110 **Ds** Darmstadtium

Atomic number — 1
Symbol — H
Name — Hydrogen
Atomic mass — 1.008

Atomic masses are not listed for elements with no stable or common isotopes.

Lanthanide Series	57 **La** Lanthanum 138.91	58 **Ce** Cerium 140.12	59 **Pr** Praseodymium 140.91	60 **Nd** Neodymium 144.24	61 **Pm** Promethium	62 **Sm** Samarium 150.36	63 **Eu** Europium 151.96
Actinide Series	89 **Ac** Actinium	90 **Th** Thorium 232.04	91 **Pa** Protactinium 231.04	92 **U** Uranium 238.03	93 **Np** Neptunium	94 **Pu** Plutonium	95 **Am** Americium

ACTIVITY PAGE 4.2

NAME: _____ DATE: _____

11 1B	12 2B	13 3A	14 4A	15 5A	16 6A	17 7A	18 8A
							2 **He** Helium 4.0026
		5 **B** Boron 10.81	6 **C** Carbon 12.011	7 **N** Nitrogen 14.007	8 **O** Oxygen 15.999	9 **F** Fluorine 18.998	10 **Ne** Neon 20.180
		13 **Al** Aluminum 26.982	14 **Si** Silicon 28.085	15 **P** Phosphorus 30.974	16 **S** Sulfur 32.06	17 **Cl** Chlorine 35.45	18 **Ar** Argon 39.948
29 **Cu** Copper 63.546	30 **Zn** Zinc 65.38	31 **Ga** Gallium 69.723	32 **Ge** Germanium 72.630	33 **As** Arsenic 74.922	34 **Se** Selenium 78.971	35 **Br** Bromine 79.904	36 **Kr** Krypton 83.798
47 **Ag** Silver 107.87	48 **Cd** Cadmium 112.41	49 **In** Indium 114.82	50 **Sn** Tin 118.71	51 **Sb** Antimony 121.76	52 **Te** Tellurium 127.60	53 **I** Iodine 126.90	54 **Xe** Xenon 131.29
79 **Au** Gold 196.97	80 **Hg** Mercury 200.59	81 **Tl** Thallium 204.38	82 **Pb** Lead 207.2	83 **Bi** Bismuth 208.98	84 **Po** Polonium	85 **At** Astatine	86 **Rn** Radon
111 **Rg** Roentgenium	112 **Cn** Copernicium	113 **Nh** Nihonium	114 **Fl** Flerovium	115 **Mc** Moscovium	116 **Lv** Livermorium	117 **Ts** Tennessine	118 **Og** Oganesson

64 **Gd** Gadolinium 157.25	65 **Tb** Terbium 158.93	66 **Dy** Dysprosium 162.50	67 **Ho** Holmium 164.93	68 **Er** Erbium 167.26	69 **Tm** Thulium 168.93	70 **Yb** Ytterbium 173.05
96 **Cm** Curium	97 **Bk** Berkelium	98 **Cf** Californium	99 **Es** Einsteinium	100 **Fm** Fermium	101 **Md** Mendelevium	102 **No** Nobelium

Source: International Union of Pure and Applied Chemistry

ACTIVITY PAGE 4.2

NAME: _____ **DATE:** _____

PART 2.

Now read the text again carefully and list the differences between metals and nonmetals that Tess describes. The first example has been completed for you.

METALS	NONMETALS
Resonant: *make a ringing sound*	***Nonresonant:*** *don't make a ringing sound*

NAME: _____ **DATE:** _____

PART 3.

Now read the descriptions of the elements below. Find the elements in the periodic table, and label whether you think they are metals or nonmetals from the descriptions in the text.

1. My little brother stole my mom's gold wedding ring while she was washing up. Next thing I knew, he was pounding it flat with a rock in the back garden! There was mud all over it, so it wasn't as shiny as normal. I managed to rescue it and take it back to her. It made a sad clinking sound when I placed it on the counter.

   Name of the element: _____

   Characteristics described: _____

   Metal or nonmetal? _____

2. Carbon is one of the most amazing elements: it is the source of all life on our planet. But it doesn't look like much. It's dark and dull, and crumbles when you press it too hard. You can't make it into shapes or wires.

   Name of the element: _____

   Characteristics described: _____

   Metal or nonmetal? _____

ACTIVITY PAGE 4.2

NAME: _____ **DATE:** _____

3. When you peel back the plastic, you can see the shiny brown wire underneath, glistening in the light. It's amazing that something so thin makes all of our lights, and the toaster, and other things in the house work. Apparently the wire is made of copper, which was discovered 11,000 years ago. I don't know why we don't make more jewelry out of it–it's so pretty.

   Name of the element: _____

   Characteristics described: _____

   Metal or nonmetal? _____

4. Sulfur is not my favorite element. When it reacts it releases a horrible rotten-egg smell. As a solid, it's yellow and brittle. It doesn't make a nice sound when you hit it (in fact, it crumbles).

   Name of the element: _____

   Characteristics described: _____

   Metal or nonmetal? _____

CHALLENGE:

Can you come up with your own examples from elements you recognize in the periodic table?

_____

_____

_____

NAME:_____ DATE:_____

COMBINE SENTENCES

Combine the following sentences:

1. The dinosaur roared. It started running toward us.

_____

_____

2. Amy was careful when lifting the plaster "egg" from the dig. The plaster "egg" contained fragile fossils.

_____

_____

_____

3. Amy might have looked bored. She was really excited.

_____

_____

ACTIVITY 4.3

NAME:_____ DATE:_____

Reduce the following sentences:

1. The fox, which was quick and colored brown, jumped over the dog, which was lazy and didn't bother to get up.

_____

_____

_____

2. The pizza, cold and clammy to the touch, made Felix grimace when he ate it.

_____

_____

_____

ACTIVITY 4.3

NAME:_____ DATE:_____

Challenge:

Can you come up with your own examples?

_____

_____

_____

_____

ACTIVITY 4.4

NAME:_____ DATE:_____

SUMMARIZING EVENTS

The Sheriff has heard some tales of strange happenings at the dig site and asked one of his junior policemen to compile a report to see if there's anything worth investigating.

Your job is to summarize the events that have befallen the campers so far, making particular note of who did what, and went where.

Your teacher will model taking notes to summarize the events for your police report from the first day for the campers. As she works, write notes with her in the space below.

When	Who	Where
Day 1–on the way to camp		
Day 1–on the way to camp		
Day 1–at the camp		
Day 1–at the camp		
Day 1–at the dig site		

ACTIVITY 4.4

NAME:_____ DATE:_____

Description	Incidents?

ACTIVITY 4.4

NAME: _____ DATE: _____

EVENTS

Now complete the table for Chapter 2 in your pairs. One of you will complete the first half of the table, and the other the second half of the table.

Partner I

When	Who	Where
Chapter 2— at the dig site		

ACTIVITY 4.4

NAME:_____ DATE:_____

Description	Incidents?

ACTIVITY 4.4

NAME:_____ DATE:_____

Partner 2

When	Who	Where

ACTIVITY 4.4

NAME:_____ DATE:_____

Description	Incidents?

Challenge

See how well you remember the events. Ask your partner to name a character, and see if you can recount all of his or her movements without looking at your table.

ACTIVITY 5.1

NAME:_____ DATE:_____

POLICE REPORT

In the space below, write a first draft of the police report to the sheriff.

Remember to:

- Concisely summarize the events.
- Make sure the sheriff can easily find the most important information.
- Be objective and state only facts.

ACTIVITY 5.1

NAME: _____ DATE: _____

Now that you have shared and discussed your work, write below how you would revise your police report on the basis of feedback you have received.

I would revise my police report by:

1. _____

_____

_____

2. _____

_____

_____

3. _____

_____

_____

ACTIVITY 5.2

NAME:_____ DATE:_____

Article 1

What is the Investigation Process?

-The Metropolitan Police (the police force of London).

The information below briefly outlines the many stages of a police investigation.

1. **Initial investigation–**this will involve a review of witnesses, scenes, and all other available evidence.
2. **Investigative assessment–**after the initial investigation a decision will then be made whether to transfer the crime to an investigating officer for further investigation or not. This assessment will take into account the following:
   - Seriousness of the offense
   - Likelihood of solvability (e.g., availability of evidence)
   - Level of resources required proportionate to the seriousness of the offense

   There are two possible outcomes at this point.

   a) **Investigation will be closed**

   b) **Crime transferred for further investigation**

3. **Further investigation–**if the crime is transferred for further investigation this will include:
   - Taking statements from the victim and any witnesses
   - Arresting and detaining any identified suspects and formally interviewing them at a police station

   At the end of the investigation there are three possible outcomes for the suspect(s).

   a) **Charged–**the suspect is told that they will be sent to court and what law they are alleged to have broken.

   b) **Cautioned–**an official warning is given in some circumstances.

   c) **No further action–**if there is insufficient evidence to charge or caution a suspect, no further action will be taken.

NAME:_____ DATE:_____

Question:

Are there any arguments from this article you would like to use?

_____

_____

_____

Article 2

Preventing crime better than catching offenders

- Daily Telegraph 29 April 2013

The chief inspector for England and Wales suggested police forces would get "more bang for their buck" if they focus on prevention rather than cure . . .

. . . Mr. Winsor, said the "primary purpose" of police is crime prevention.

"Sir Robert Peel who founded the modern police service in 1829, said the primary test of police efficiency is the absence of crime and disorder," he said.

"If we can prevent offences taking place we prevent there being any victims, which is absolutely critical, and also we save all of those costs . . . ."

Question:

Are there any arguments from this article you would like to use?

_____

_____

_____

ACTIVITY 5.3

NAME:_____ DATE:_____

Now that you have read the resources, prepare a statement below making your case to your partner. It can be just a few sentences. Remember you are trying to persuade your partner that you are right.

Remember a good opening statement:

- is clear.
- makes your argument.
- is "punchy" and compelling. You can use stories, for example, to make your argument.

Cite evidence from the Reader or one of the two articles to support your argument.

I think there should/should not be an investigation because

NAME:_____ DATE:_____

DEBATE ON THE SHERIFF

If you are playing the Sheriff, use the rubric below to judge the two police officers. Fill it in as they debate.

	Police Officer 1 (name: _____) Arguing for an investigation	**Police Officer 2** (name: _____) Arguing against an investigation
Was the person speaking clearly and maintaining eye contact?	**Y / N**	**Y / N**
Did they use evidence from the text in their argument? How many pieces?	**Y / N** Number: _____	**Y / N** Number: _____
Did they use evidence from the other articles in the other resources?	**Y / N**	**Y / N**
Did they use other techniques—stories for example—that made their argument more compelling?	**Y / N** Please give details.	**Y / N** Please give details.

ACTIVITY 6.1

NAME:_____ DATE:_____

As you read Chapter 4 in your pairs, complete the questions below. One of you should complete the questions for Julian and the other for Kristal. You will then use the answers to these questions to continue to develop your character maps from Lesson 3 (Activity Page 3.3).

JULIAN

How does Julian feel when he is told his discovery isn't gold? Quote from the text.

_____

Why does Julian feel this way? Can you point to clues about Julian's personality from other chapters to help you answer?

_____

_____

Challenge:

Why might Julian not wish to look for small fossils anymore?

_____

_____

_____

NAME:_____ DATE:_____

KRISTAL

Why did Kristal's eyes go "wide with surprise"?

_____

_____

Why is Kristal worried about people seeing her drawings?

_____

_____

What do you think Kristal's reluctance to show her drawings tells us about her character?

_____

_____

Language Challenge

Now answer the following questions in your pair.

The text says Amy's mind keeps "wandering." Wander is another word for walk. What kind of literary device is it to say that Amy's mind is wandering?

_____

What is the link between the literal and the metaphorical definition of something "wandering"?

_____

_____

ACTIVITY PAGE 6.2

NAME: _____ **DATE:** _____

In your pairs, read below the paragraphs from the Reader and answer the questions about the text.

1. He cleared his throat and suddenly turned to Tess. "I was wondering, Tess, just what is the difference between gold and fool's gold?"

   Amy thought Felix just asked the question to turn her attention away from him.

   Tess didn't notice, though, and was happy to answer it. "Remember that atoms are the smallest unit of elements. The thing is, you don't find many atoms all by themselves in nature. Atoms typically join together, or bond as chemists say, into groups of two or more to form molecules. Some molecules and substances are made up of atoms of just a single element. Oxygen, for example, is two oxygen atoms bonded together as a molecule."

   How are atoms usually found in nature?

   _____

   _____

   _____

ACTIVITY PAGE 6.2

NAME: _____ **DATE:** _____

2. "Most molecules or substances, though, are combinations of two or more different atoms. The chemical formula of iron pyrite, for example, has two atoms of the element sulfur bonded to an atom of the element iron. Molecules or substances that contain atoms of two or more different elements are called compounds. Water is another example of a compound. Water is a compound made up of two atoms of the element hydrogen and one atom of the element oxygen."

   Are molecules and substances usually made up of one element or more than one? What are molecules or substances made up of more than one element called?

ACTIVITY PAGE 6.2

NAME: _____ **DATE:** _____

3. "Is that why people sometimes call water 'H-2-O'?" Daria asked.

   "Precisely," Tess replied. "When two or more different types of atoms bond together, they create compounds, which you can find everywhere and in everything. This sandstone rock we're scratching away at is a compound. So are these dinosaur fossils, and the tools we're using. Each one of you is a walking, talking collection of different compounds that make up your bones, muscles, nerves, and everything else in your bodies."

   Why is Daria "precisely" right?

   _____

   _____

ACTIVITY PAGE 6.3

NAME: _____ **DATE:** _____

As your teacher summarizes the first paragraph in Activity Page 6.2, copy his or her summary below.

Now work in your pairs to summarize paragraphs 2 and 3 below.

Remember to think about:

- Whether the information is chemical content.
- Whether you really need the information to understand the content.
- **Hint:** Examples might be helpful, but it is not necessary when summarizing to include them all.

ACTIVITY 6.4

NAME:_____ DATE:_____

COMMAS

With the sentences below, circle the subject of the sentence and then insert a comma after the introductory element.

1. To find the clues Amy had to get up very early in the morning.

2. Sensing something was wrong Matt decided to call his sister.

3. With a gulp and a glance at Felix Julian approached the snake.

ACTIVITY PAGE 7.1

NAME: _____ **DATE:** _____

Answer the questions below as you read the first half of Chapter 5.

1. What is a mixture?

2. Tess says that however much you stir a mixture, the physical properties do not change. Name examples of physical properties that do not change. (Hint: Look back at the second half of Chapter 1 in the Reader.)

3. Imagine a container with sugar dissolved in water. Can you use the information you learned about evaporation to explain how sugar crystals might be left behind if the container were left outside on a hot day? (Hint: Sugar does not change state until it is much hotter than a hot day would make it.)

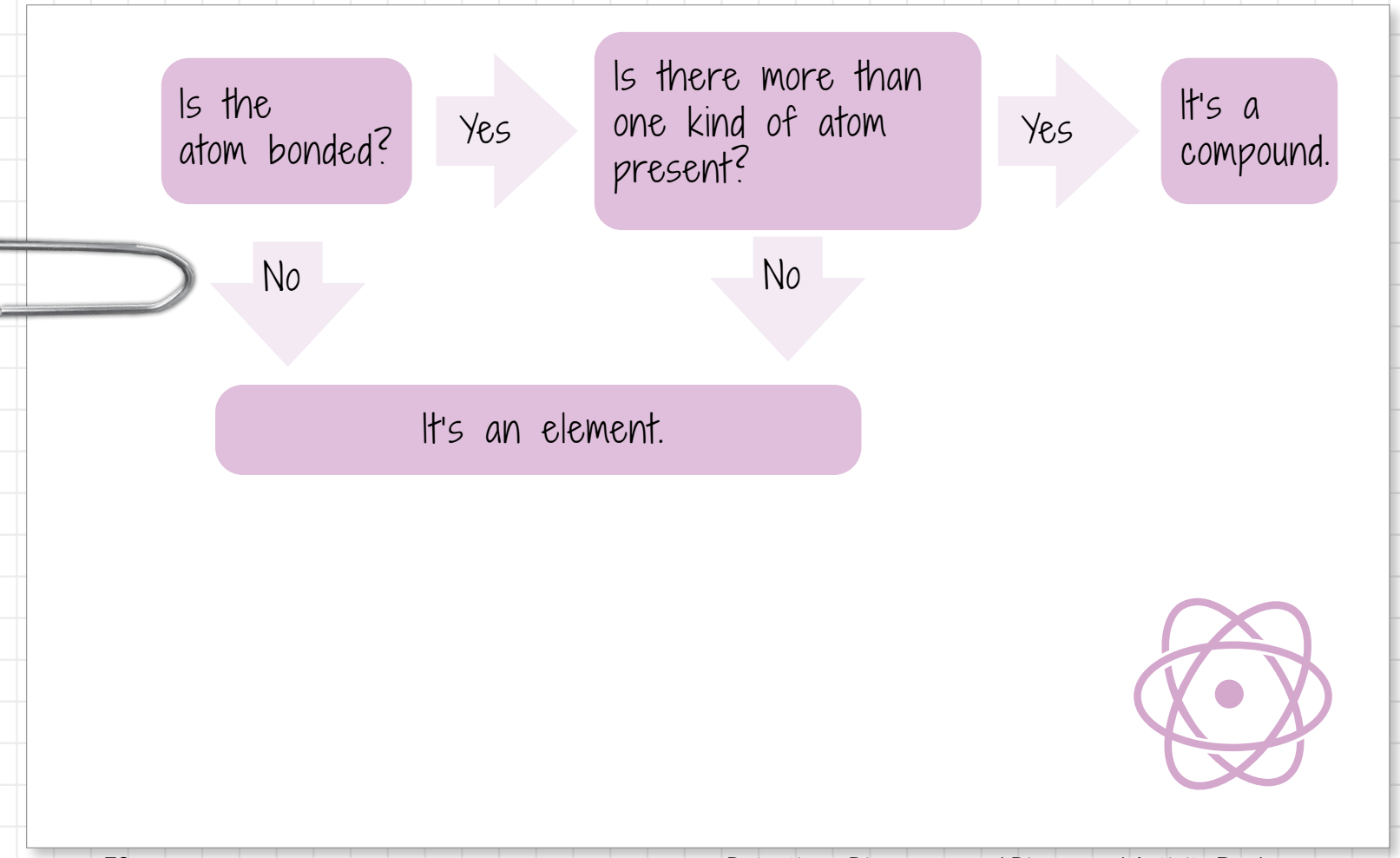
NAME: _____ DATE: _____

"TESS'S RULES"

Scientists have to be very precise about their terms and concepts. I can't say something is a solution when really it's a compound. All sorts of terrible things might happen! For example, for medicines to be safe and effective we need to know exactly what kinds of elements, compounds, mixtures, and solutions are being used.

Below are my rules for deciding if something is an element or a compound. I devised my rules by asking myself the following questions:

- Can people use this rule to answer the question, "Is something an element or a compound?"
- Is it possible to decide the answer to the question I ask in each case?
- Is the chart organized in a way that is easy to understand and use?



ACTIVITY PAGE 7.2

NAME: _____ **DATE:** _____

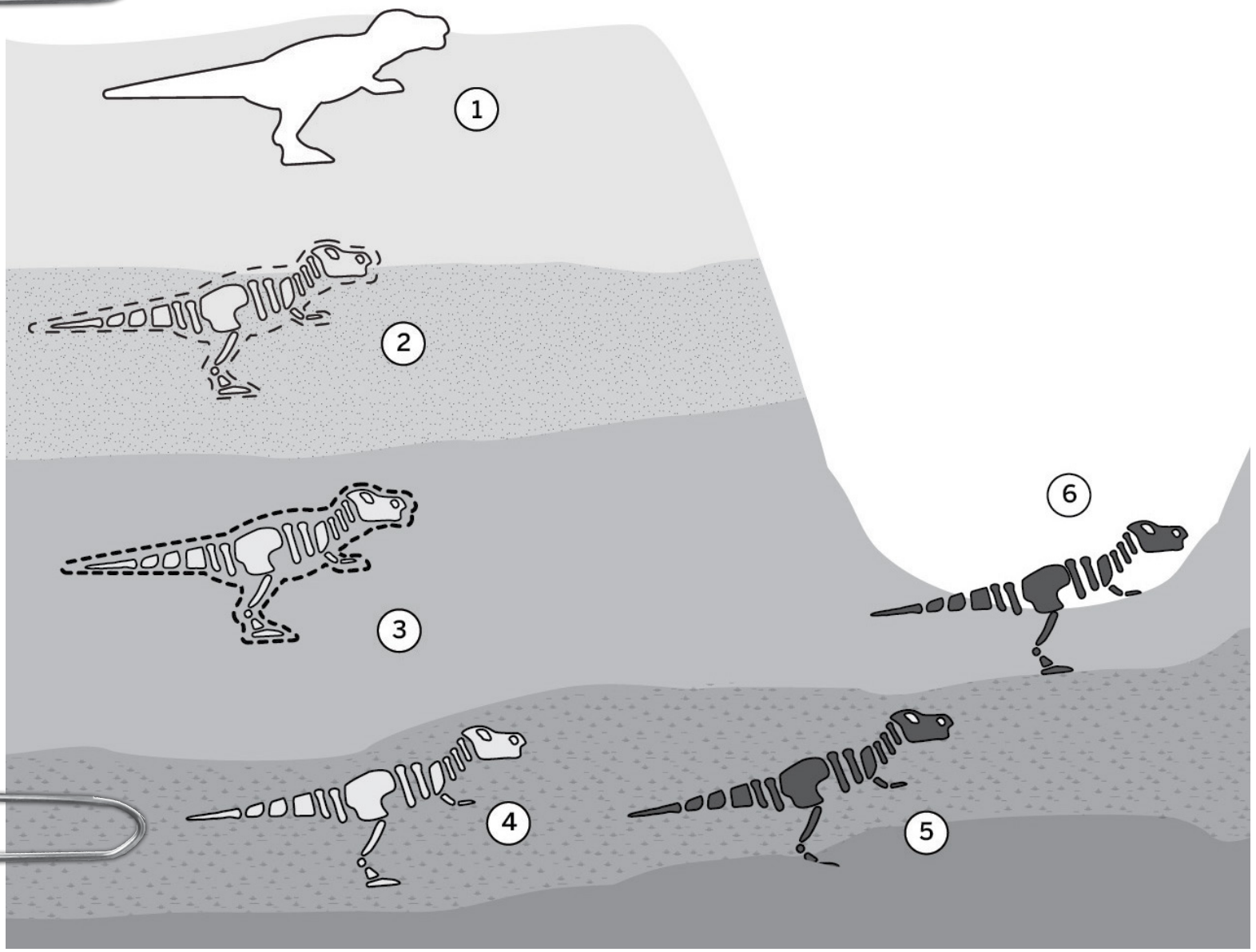
In the space below, create your own "Tess's Rules" for distinguishing between a mixture, a solution, and a compound.

ACTIVITY PAGE 7.3

NAME: _____ **DATE:** _____

Look at the diagram below. Place quotes from the Reader text on the next page under the relevant number ("as the bones slowly decay . . .") to explain in more detail what is occurring. Examples from the text for an earlier section have been completed for you.

How Fossils are Formed



ACTIVITY PAGE 7.3

NAME: _____ **DATE:** _____

1. The animal dies.

2. The remains of the body start to rot and get covered with mud.

   "His body was covered beneath a thick layer of muddy sand."

3. Over time, layers of sediments cover the bones.

   "It was preserved for a long time, sealed beneath tons of sand."

4. The sediments encasing the bones harden into rock.

5. As the bones slowly decay, minerals filter down into space and replace the chemicals in the bones.

6. Layers of rock get worn away by wind and rain (erosion), and a fossil is discovered!

ACTIVITY PAGE 7.3

NAME: _____ **DATE:** _____

Now fill in the additional information from the Reader you have found in your "treasure hunt."

LESSON AND ACTIVITY PAGE	WHAT YOU LEARNED	HOW IT HELPS YOU UNDERSTAND FOSSIL CREATION
1.2, 3.2	*Matter can be in different states: liquid, solid, and gas.*	*When water evaporates from liquid to gas, it leaves behind compounds that become the Achy Breaky fossil.*

ACTIVITY PAGE 7.4

NAME: _____ **DATE:** _____

Use the rubric below as the other small group presents on fossil creation.

	GROUP
Was the person speaking clearly and maintaining eye contact?	Y / N
Did every member of the group get a chance to speak?	Y / N
Did they use evidence from the diagram and Chapter 5 in their presentation? How many pieces?	Y / N Number: _____
Did they use evidence from other chapters in their presentation? How many pieces?	Y / N Number: _____
Did they use other techniques—stories for example—that made their argument more compelling?	Y / N Please give details:

ACTIVITY 8.1

NAME:_____ DATE:_____

Hi, everyone. Your favorite detective is back (that's me, Inspector Ellis, if you were wondering) and here to help you solve the case. It's a pleasure to help when you have a devoted fan like Amy.

It seems pretty clear we have a case on our hands. So we are going to practice making deductions. Don't worry if you're slower than I am—I am brilliant (as I mentioned before). Plus, I've practiced. A lot. You don't become one of the best detectives in the world (probably the best) without investigating a lot of cases.

Amy, who is a brilliant detective in training, has decided that the thief must be "one of us." A dramatic accusation! Our task is to decide if her deductions are correct.

First, let's review Amy's actions in the text. Fill in the table below, starting to read from "Amy was trying to think like Inspector Ellis" (smart girl!) up to "the thief is one of us!" I've done the first example for you.

What Amy did	What Amy saw or said/thought
Added a possibility in her notebook	*Yesterday the soil would have been smoothed by the rain. So if fossil thieves had parked and walked to the camp, there should be clear tire tracks and boot prints.*
Slipped out of camp	
Returns to camp and talks to Matt	

ACTIVITY 8.1

NAME:_____ DATE:_____

Now answer the questions to see if you have been paying attention.

1. What was Amy looking for and what did she find?

2. Amy says "no clue is a clue in itself." What does she mean?

3. Do you think the evidence supports the hypothesis that there were fossil thieves arriving in an SUV or pickup truck?

4. Do you think Amy's deduction was correct? Why?

ACTIVITY 8.2

NAME:_____ DATE:_____

OPINION WRITING ON CHARACTER

Answer the question below.

- If you were creating maps for Julian and Kristal, answer for Julian.
- If you were creating maps for Felix and the squirrels, answer for Felix.
- If you were creating maps for Daria and the SUV, answer for Daria.

Look at the information you marked on your character maps that represented Amy's opinion rather than fact. Using that information, answer the following question:

What assumptions has Amy made about your character's behavior?

Do you think those assumptions are valid?

ACTIVITY 8.2

NAME: _____ DATE: _____



ACTIVITY 9.1

NAME:_____ DATE:_____

Use the questions and rubric below to guide you as you think about your presentation.

As You Prepare Your Presentation

Review your character maps, and use the information to structure your presentation using the guidance below.

1. You should begin by introducing your character. Who are they?
2. What important objective information do we know about the character?
3. Does that information point to them being a suspect or not? Or is it impossible to know?
4. What subjective information would you add about the character? Does that change your suspicions?
5. What further evidence would you like the sheriff's permission to look for? How would you like to collect that evidence? For example, you could look for clues, or interview the characters, or check their alibis.

You should also read the rubric in Activity Page 9.2 that students will use as they listen to the presentations. Keep the rubric criteria in mind as you consider what you will say.

ACTIVITY 9.1

NAME: _____ DATE: _____

In the space below, write down notes to help your presentation.

ACTIVITY 9.2

NAME:_____ DATE:_____

PRESENTATION TO SHERIFF

Use the rubric below to judge the reports on the character.
Fill it in as each character is presented.

Question	Characters being presented: Name of student:
Was the person speaking clearly and maintaining eye contact?	Y / N
Did they introduce the character clearly, using information from the text?	Y / N Details:
Did they identify objective information about the character?	Y / N Details:
Did they use that evidence to explain whether the character was a likely suspect?	Y / N Details:

ACTIVITY 9.2

NAME:_____ DATE:_____

Characters being presented: Name of student:	Characters being presented: Name of student:
Y / N	Y / N
Y / N Details:	Y / N Details:
Y / N Details:	Y / N Details:
Y / N Details:	Y / N Details:

ACTIVITY 9.2

NAME: _____ DATE: _____

Did they identify subjective information about the character?	**Y / N** Details:
Was it clear when evidence was subjective and when it was objective?	**Y / N** Details:
Was it clear what the presenter would like to find out next about the character?	**Y / N** Details:
Did this link to their evidence?	**Y / N** Details:

ACTIVITY 9.2

NAME: _____ DATE: _____

Y / N Details:	Y / N Details:
Y / N Details:	Y / N Details:
Y / N Details:	Y / N Details:
Y / N Details:	Y / N Details:

ACTIVITY PAGE 9.3

NAME: _____ **DATE:** _____

Use evidence from the text to answer the questions below.

1. Below is a list of the stages of removing fossil bones. Number the stages in the correct order (so 1 would be the step described first in the text). Circle any steps in which a chemical change is happening.

   _____ Soaking strips of burlap in the plaster.

   _____ Applying more strips on the bottom to create an "egg."

   _____ Mixing plaster of paris with water in a bucket.

   _____ Covering the fossil with the strips of burlap.

   _____ Breaking the plaster with a chisel and hammer.

   _____ Covering fossil with damp paper towels (make sure rock pillar is seen).

2. How does Tess explain the difference between a physical change and a chemical change?

   _____

   _____

   _____

NAME: _____ **DATE:** _____

3. What happens in a chemical change?

_____

_____

_____

4. If matter goes through a chemical change, are the physical properties likely to stay the same?

_____

_____

_____

5. Why does the warm bucket suggest a chemical change has taken place?

_____

_____

_____

ACTIVITY PAGE 9.4

NAME: _____ DATE: _____

CHEMICAL AND PHYSICAL CHANGE RULES

In the space below, create your own rules for distinguishing between a chemical change and a physical change.

NAME: _____ DATE: _____

IDENTIFYING EVIDENCE

As you read Chapter 7, note below the chemical changes the campers identify. In each case write down the chemical change and what evidence the camper or Tess offers to demonstrate it's a chemical change. The first one has been completed for you.

CAMPER(S)	CHEMICAL CHANGE	EVIDENCE GIVEN BY CAMPER
Matt and Daria	*wood burning*	*giving off heat and light* *not reversible (can't turn ash into wood)*
Felix and Kristal		
Amy and Tess		
Kristal		

ACTIVITY PAGE 10.1

NAME: _____ **DATE:** _____

Do you think some of the campers identify better evidence than others? Who do you think made the best case, and who made the weakest? Why? Make sure you quote from the text in your answer.

NAME:_____ DATE:_____

LETTER TO THE SHERIFF

In the space on following page, write a letter to the sheriff explaining the plan to catch the thief. You are hoping he will agree it is a good plan. Remember, the sheriff doesn't know any chemistry, so you will have to explain the physical and chemical changes. If you need help, use the notes in your activity book and the earlier chapters in the Reader to help you. You may find the "Tess's rules" you have created helpful.

Before you write the letter you should consider:

1. The appropriate way to address the sheriff. How should you begin your letter?
2. What evidence you should be presenting to the sheriff to explain why this is a good plan to catch a thief. You should think about the use of objective evidence and subjective evidence when you created your evidence boards. Why is this objective evidence?
3. How you wish to conclude the letter. Remember, you want the sheriff to agree with this plan.

ACTIVITY 10.2

NAME: _____ DATE: _____

There is a graphic organizer on the next page to help you organize your letter.

Write your letter below:

Dear Sheriff,

ACTIVITY 10.2

NAME: _____ DATE: _____

ACTIVITY 10.2

NAME:_____ DATE:_____

Challenge:

Can you come up with other plans to catch the thief using chemical and physical changes? See if you can use the materials around the campsite (like ash, wood, and marshmallows) to come up with a new plan.

You may wish to use the graphic organizer below to help you with your letter.

	Part 1: Physical Change	Part 2: Chemical Change
Matter Amy Uses		
What will happen to the matter?		
Why is this a physical/ chemical change? (You may need to refer back to previous notes and chapters.)		
Why does this help catch the thief?		
Why is this objective evidence?		

NAME:_____ DATE:_____

COMMAS

Read the conversation below and **place commas** in the correct places.

"You're a bit grumpy today aren't you" said Matt.

"No I'm just bored" sighed Amy.

Realizing the solution Matt went to the bookshelf and grabbed a detective novel.

"Try this" Matt said.

"Thanks!" responded Amy. "You know me pretty well don't you?" she added.

"Yes I guess I do" said Matt grinning.

ACTIVITY 10.4

NAME:_____ DATE:_____

MORPHOLOGY

Write the correct word to complete each sentence.

1. "I waited outside the sheriff's office for about half an hour before he gave me _____ to enter."
   (admission, permission, remission, emission)

2. "The squirrel _____ a loud chirruping sound before running away."
   (admitted, emitted, transmitted, permitted)

3. "The man from the SUV _____ he was lost."
   (admitted, emitted, transmitted, permitted)

4. "She was successful in her first _____."
   (missile, mission, remittance, committal)

NAME:_____ DATE:_____

ACCUSATION TO THE SHERIFF

Use the questions below as you decide how to organize your evidence board.

Does the organization of your board:

1. Distinguish between evidence for the character and evidence against the character being the fossil thief?
2. Distinguish between strong or objective evidence and weak or subjective evidence?
3. Allow you to form links between different pieces of information (for example, with lines between pieces of information or color coding)?

Draw in the rectangle below how you plan to organize your board. You can check that it meets your aims before drawing on the board itself.

ACTIVITY 11.2

NAME:_____ DATE:_____

Use the table below to take notes in your group as you look at the evidence boards.

	Motive?
Julian	
Kristal	
Felix	
Daria	
Squirrels	
SUV	

ACTIVITY 11.2

NAME:_____ DATE:_____

Means?	Opportunity?

ACTIVITY 11.3

NAME: _____ DATE: _____

I believe the fossils were stolen by _____.

I believe this because they had the:

1. Motive

Evidence: _____

_____

_____

_____

Two examples from text: _____

_____

_____

_____

_____

2. Means

Evidence: _____

_____

_____

_____

NAME:_____ DATE:_____

3. **Opportunity**

Evidence:_____

_____

_____

_____

Challenge:

Does your "Opportunity" section explain the opportunity to steal the fossils on both occasions?

ACTIVITY 11.4

NAME:_____ DATE:_____

Question
Was the group speaking clearly and maintaining eye contact?
Did they clearly state whom they were accusing?
Did they identify a clear motive, using evidence from the text?
Did they explain how the suspect had the means to commit the crime, using evidence from the text?
Did they explain how the suspect had the opportunity to commit the crime, using evidence from the text?
Was it clear when evidence was subjective and when it was objective?
Do you think the evidence was convincing? Why or why not?

ACTIVITY 11.4

NAME:_____ DATE:_____

Name of suspect accused:
Students in small group:
Y / N
Y / N
Y / N Details:
Y / N Details:
Y / N Details:
Y / N Details:
Y / N Details:

ACTIVITY 12.1

NAME: _____ DATE: _____

Event: What happened?	When did it happen?
"I snuck in here later that night to see them for myself. I'd picked one up to look at it more closely when I thought I heard someone coming, and without thinking I shoved the fossil into my pocket and slipped out the back of the tent."	*at the end of Chapter 2 (the second night at camp)*
"I thought I'd just put the fossil back when no one was looking, and she'd just assume she misplaced it. But every time I tried to do that, either Tess or Dr. Forester was here in the lab."	

ACTIVITY 12.1

NAME:_____ DATE:_____

Why did it happen?	Were there any clues this was happening?
Julian "didn't want to wait" until the morning to see the fossils.	*"I want to look at them!" Julian said, jumping up from his chair and heading for the lab.* *Dr. Forester caught him by the shoulder. "If you don't mind, Julian, let's wait until morning. It's really time for everyone to head for bed."* *Julian shrugged and reluctantly said, "Okay."* *(quote from end of chapter 2)*

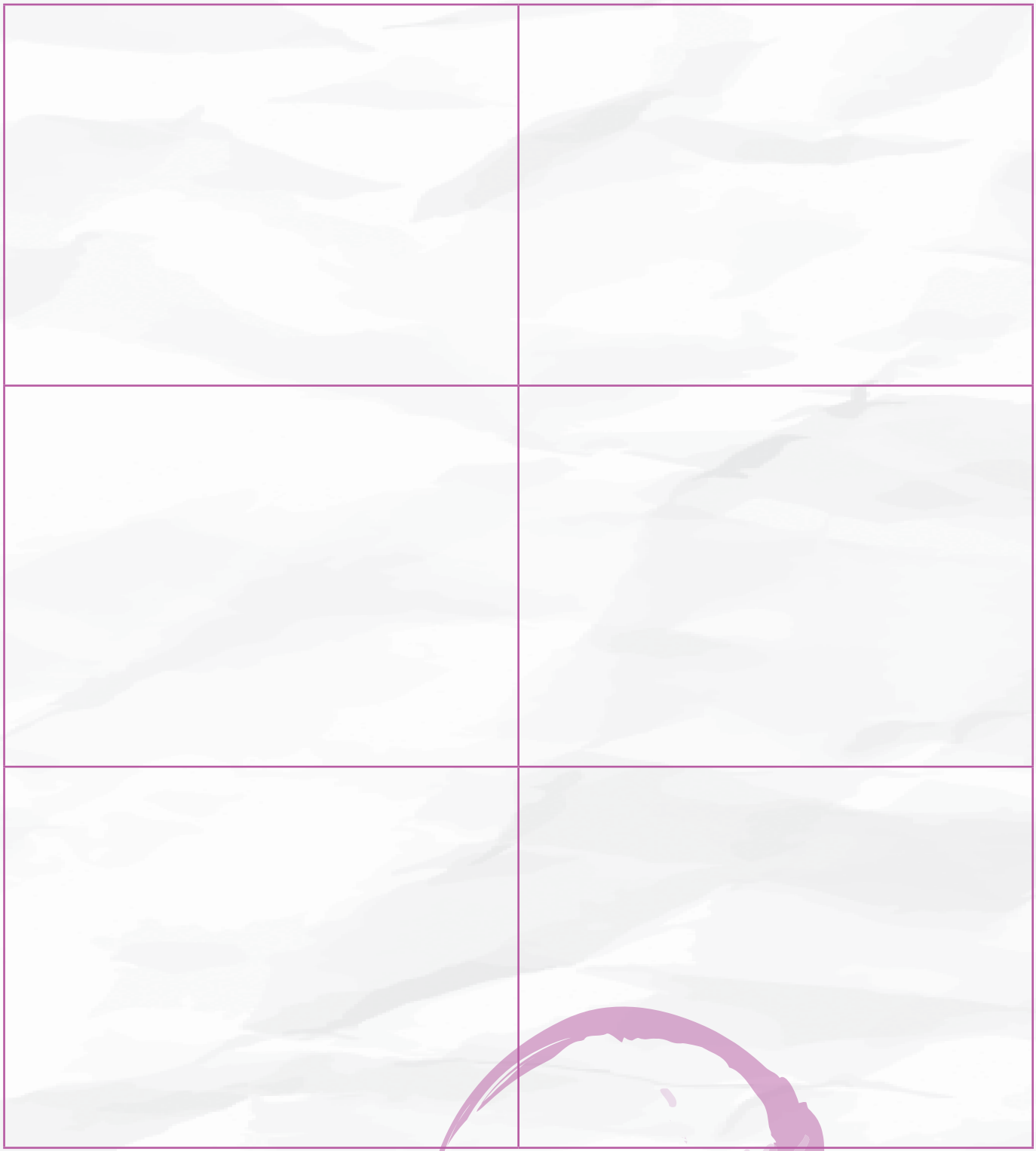
ACTIVITY 12.1

NAME:_____ DATE:_____

"Then we found more fossils and Dr. Forester started talking about how great it would be if she could get some of them to fit together. I thought since I had the missing piece that maybe I could use it to figure that out, and maybe it would turn out be an important new discovery."	
"Once I had the fossils, I couldn't make any sense of them. I couldn't even figure out a way to put them back in the lab without getting caught. So I put them in a sack and hid them under a bush."	
"So last night I brought the fossils back and put them there on the table. It seemed better than being caught with them red-handed or having to admit in front of everyone what I did. I didn't think much further than that."	

ACTIVITY 12.1

NAME: _____ DATE: _____



ACTIVITY 12.2

NAME:_____ DATE:_____

	Character *(circle the appropriate one)* **SUV** **squirrels** **Felix** **Daria**	**Character** *(circle the appropriate one)* **SUV** **squirrels** **Felix** **Daria**
What information do we learn about this character in Chapter 8?		

NAME:_____ DATE:_____

ACCUSATION TO THE SHERIFF

As you work with the teacher, fill in the table below.

	Character's wants	Character's behavior	Character's resolution
Daria	*She misses her mother.*		
Felix			
Squirrels			
SUV			

ACTIVITY 12.4

NAME: _____ DATE: _____

GRAMMAR

1. **Use the word in brackets** to complete the sentence, turning the word into the past perfect tense.

   They ate the snacks that Felix _____. (provides)

   Amy read the letter Inspector Ellis _____. (send)

   They talked about the case they _____. (solve)

   I edged away from the snake I _____. (spot)

   We carefully removed the egg we _____. (excavate)

2. **For two of the example sentences above,** can you list the order of the actions in the space below?

ACTIVITY PAGE 13.1

NAME: _____ **DATE:** _____

Today you will read two pieces about chemical matter. After reading the excerpts, you will answer several questions based on the texts. Some of the questions have two parts. You should answer Part A of the question before you answer Part B.

The Ancient Art of Making Salt

1 Salt is a chemical compound known to chemists as sodium chloride. A molecule of sodium chloride contains one atom of the element sodium (chemical symbol Na) and one atom of the element chlorine (chemical symbol Cl) bonded together. If you look closely at ordinary table salt, the kind you find in saltshakers on restaurant tables, you'll see that this compound occurs as tiny, white, cube-shaped crystals.

2 Salt is surely one of the world's most common seasonings and has been for thousands of years. Since ancient times, people have cooked with salt, added it to breads and other baked goods, and sprinkled it directly on foods to improve their taste. Salt is so plentiful and inexpensive in the modern world that we hardly think twice when we grab a saltshaker and shake some of these tiny white crystals onto popcorn or corn on the cob.

3 But where does salt come from? In some parts of the world there are large deposits of salt deep underground, and salt is mined like other minerals such as silver or iron. Probably the oldest source of salt, however, is seawater. Seawater is a solution containing a number of dissolved substances, but salt (chemical symbol NaCl) makes up the greatest proportion of these dissolved substances. If you have ever gone swimming in the ocean and swallowed a little seawater, you know that it really does taste salty!

4 In ancient times, people who lived near the ocean obtained salt from seawater by letting the water evaporate and exploiting this physical change in the state of matter to separate out the salt. As the water in seawater evaporates, the salt

NAME: _____ DATE: _____

remains behind as tiny crystals. This traditional method of harvesting salt from the ocean continues today. The process begins when seawater is channeled into large, very shallow ponds with low walls around them so the water cannot run out or flow back into the ocean. Then the water is simply allowed to evaporate with the help of heat from the sun. Because the sun provides the heat to power the salt-making process, salt produced this way is sometimes called solar salt.

5 Depending on the temperature, the evaporation process may take many months or even years, ending only when all the water has changed state into water vapor, leaving behind flat beds covered with a thick layer of salt crystals. The salt crystals are raked into piles and put into bags or shoveled onto trucks that deliver the salt to factories where it is processed and packaged. Because solar salt production relies on evaporation, it is easy to understand why most salt ponds are in places that tend to be hot and dry, and have very little rain. Imagine how frustrating it would be to have a bed of solar salt almost dry enough to harvest, only to have a thunderstorm flood the pond with rainwater so that all the salt dissolves again!

6 Not all solar salt is produced from seawater, however. The Great Salt Lake in Utah is one of the saltiest bodies of water on the earth, much saltier than the ocean. It is salty because rivers flow into the lake, bringing water that contains dissolved salt, but no water flows out. As water evaporates from this enormous lake—the largest body of water between the Great Lakes and the Pacific Ocean—the salt becomes more and more concentrated. Depending on the time of year (and the amount of rainfall) the Great Salt Lake is typically three to five times saltier than the ocean. In fact, the Great Salt Lake is too salty for fish and most other types of living things that you would expect to find in a lake. About the only animals able to live in the Great Salt Lake are tiny brine shrimp, a favorite food of certain types of birds—and of fish kept in aquariums. If you've ever had fish as pets, you may have fed them dried brine shrimp harvested from the Great Salt Lake!

ACTIVITY PAGE 13.1

NAME: _____ **DATE:** _____

7 Commercial solar salt-making around the Great Salt Lake began in 1847, although Native Americans living in the region probably made use of salt deposits that formed along the lakeshore long before that. Scientists estimate that there are nearly 5 billion tons of salt in the Great Salt Lake. Every year roughly 2.5 million tons of solar salt are extracted from the lake's salty waters, having been produced in commercial evaporation ponds. Salt from the Great Salt Lake is also rich in the elements potassium, magnesium, and sulfur.

NAME: _____ DATE: _____

The Atomic Ice Cream Shop

1 Alice pushed open the heavy door of the ice cream shop and flopped down in a chair at one of the small metal tables. Her friend Trevor was right behind her, but he stopped for a moment to glance up at the big chalkboard that listed the day's ice cream flavors in several columns.

2 "Mmmm, they have chocolate peanut butter swirl today," he said, slipping into a chair across from Alice. "That's one of my absolute favorites."

3 "Oh, Trevor, I have so much homework to do," Alice lamented. "And I didn't really get what Mr. Matobi talked about in science today, all that stuff about atoms and elements and molecules and compounds. I can't keep those terms straight in my head."

4 "Well, maybe I can help." Trevor sat up straight and cleared his throat. "All matter is made up of small particles called atoms. There are more than a hundred different kinds of atoms and each kind is called an element. The elements are all listed on the periodic table of the elements that we have hanging on the wall in science class. Now atoms of various elements can combine—"

5 "Wait, wait, wait!" said Alice. "You're confusing me even more. Let's start at the beginning: what's the difference between an atom and an element?"

6 Trevor took a deep breath and said in a slow, even voice, "An element is a building block of matter that can't be simplified, while an atom is the smallest amount of an element you can have."

7 Alice looked cross-eyed at her friend. "I'm never going to get this, Trevor. You've got to make it simpler somehow!"

ACTIVITY PAGE 13.1

NAME: _____ **DATE:** _____

8 "Hmmm," Trevor said, glancing around the ice cream shop. His gaze fell on the chalkboard again, with all the many flavors of ice cream written in colored chalk. "I've got an idea. Let's say that the chalkboard up there is like the periodic table of the elements. Each ice cream flavor that's listed is like an element, a building block that we can use to create a fantastic dessert. Okay so far?"

9 Alice stared up at the board and nodded. "Got it. Each flavor of ice cream is an element."

10 "Now, the smallest portion of ice cream you can buy here is one scoop," Trevor continued. "So let's say that one scoop of ice cream is like an atom. An atom is the smallest amount of an element you can have that still has that element's properties."

11 "Okay, one scoop equals an atom," Alice repeated.

12 "Now, suppose I decided to get two scoops of chocolate peanut butter swirl. The girl behind the counter would put those two scoops in a waffle cone and kind of mash them together so they would stay put. Those two scoops are like two atoms of the same element—in this case, chocolate peanut butter swirl—bonded together to form a molecule."

13 "Oh, yes, that makes sense," said Alice. "Atoms bonded together form molecules."

14 "Now, suppose you ordered one scoop of raspberry cheesecake and one scoop of French vanilla. When the girl behind the counter puts those two different flavors of ice cream together in a cone, you've got a molecule made up of atoms of two different elements, which is—"

15 "—a compound!" Alice finished triumphantly. "Trevor, I think I've got it. So let me repeat that back to you, but without the ice cream analogy."

NAME: _____ **DATE:** _____

16 "Shoot," said Trevor, sitting back in his chair.

17 "An element is a basic substance that is one of the building blocks of matter," Alice said evenly. "The periodic table lists all the elements. An atom is the smallest amount of an element you can have that still has the properties of that element. A molecule is two—"

18 "—or more," Trevor interrupted. "We could get three scoops, or four, or . . ."

19 Alice put up her hand. "A molecule is two or more atoms bonded together. And a compound is a molecule that contains more than one kind of element!"

20 "Outstanding!" her friend said with a smile. "I just want to add that sometimes, two different flavors, or atoms, bond together into a molecule instead of a compound. The gas carbon monoxide is an example of that."

21 "Thanks, Trevor," Alice said, getting out her purse. "And to show you how much I appreciate your help, I'm going to buy your ice cream cone. What'll you have?"

22 Trevor's eyes lit up. "I'll have a compound made up of the elements chocolate peanut butter, caramel swirl, and rocky road."

23 Alice laughed. "With those flavors, it'll be a molecule that's definitely a new kind of matter!"

ACTIVITY PAGE 13.1

NAME: _____ **DATE:** _____

1. The word *evaporate* appears several times in the first excerpt. What is the meaning of the word *evaporate*?

   A. to turn from a solid to a liquid

   B. to turn from a liquid to a gas

   C. to turn from a gas to a liquid

   D. to turn from a liquid to a solid

2. Can you provide a detail from paragraph 5 that helps the reader determine the meaning of the word *evaporate*?

   _____

   _____

   _____

3. From the first excerpt, list three ways in which salt is produced. Give the paragraph number where the method is first introduced.

   _____

   _____

   _____

   _____

NAME: _____ **DATE:** _____

4. "Because solar salt production relies on evaporation, it is easy to understand why most salt ponds are located in places that tend to be hot and dry, and have very little rain." Explain why this is easy to understand.

5. We are told that Alice "lamented." From the context, what do you think *lamented* means?

   A. to express sorrow

   B. to express happiness

   C. to express tiredness

   D. to express laziness

   Give a reason from the text for your answer.

6. In the last paragraph of the second excerpt we are told Trevor's eyes "lit up." Is that a literal description? If not, what is it?

ACTIVITY PAGE 13.1

NAME: _____ **DATE:** _____

7. What inference can we make about Alice's feelings about science from the second excerpt?

   A. She hates it.

   B. She is confused by it.

   C. It is her favorite subject.

   D. It is okay but she prefers ice cream.

   Provide evidence from the text, citing the paragraph number or providing quotes, for your answer below.

8. One of these excerpts is informational, and the other is literary. Can you identify which is which? Provide reasons for your answer.

9. For the literary text, can you name some informational elements in that text?

NAME: _____ **DATE:** _____

10. In the table below, describe how Trevor uses ice cream as an analogy for atoms and compounds.

Concept	**How it links to ice cream**
periodic table of elements	*chalkboard showing ice cream flavors*

ACTIVITY PAGE 13.1

NAME: _____ **DATE:** _____

11. Read both excerpts. Can you use the information on elements and compounds in the second excerpt along with information from the first excerpt to explain why salt is a compound? Reference the text from the excerpts you are using.

12. Read both excerpts. Can you explain, using examples from both excerpts, the differences between an element, a compound, and a solution?

NAME: _____ **DATE:** _____

13. Reread paragraphs 4 and 5 of the first excerpt. In the space below, write a narrative literary text that conveys the content in these paragraphs. Complete the table underneath your narrative to explain what you have done.

ACTIVITY PAGE 13.1

NAME: _____ **DATE:** _____

The facts I have conveyed	1. 2. 3.
My literary characteristic 1	
My literary characteristic 2	
My literary characteristic 3	

ACTIVITY PAGE 13.1

NAME: _____ DATE: _____

Grammar

1. Expand each sentence below using descriptive details, including adjectives and adverbs. You may replace words if you maintain the same meaning.

   - Amy solved the case.
   - I listened to Trevor's explanation.
   - She walked into the ice cream parlor.

2. Combine each pair of sentences below and underline the linking word you have used.

   - I went into the ice cream parlor. The owner smiled at me.
   - I went into the ice cream parlor. I was hungry.
   - I went into the ice cream parlor. I walked right out again.

ACTIVITY PAGE 13.1

NAME: _____ **DATE:** _____

3. Reduce each of the following sentences to be as concise as possible.

   - The ice cream, soft and tingly on the tongue, made me sigh with pleasure as I devoured it.
   - Salt, which is a fascinating compound, can be extracted in many ways, some of them from ancient times, while some are more modern.

_____

_____

_____

_____

4. Circle the subject of each sentence below and then insert a comma after the introductory element.

   A. To be first in line Alice had to queue outside the parlor for a long time.

   B. Realizing she was annoyed Trevor let Alice finish her sentence.

   C. Putting her hand in her pocket Alice said, "I'll buy this."

5. Insert a comma into each of the sentences below in the relevant place and circle it.

   A. You think I'm talking too much don't you?

   B. Yes I suppose I do.

   C. It wouldn't help if I taped my mouth shut would it?

   D. No I don't think that's a good idea.

NAME: _____ **DATE:** _____

6. Use the events below to construct sentences in the past perfect tense.

   Event 1: going to the ice cream parlor; Event 2: learning about chemistry

   _____

   _____

   Event 1: evaporating seawater; Event 2: extracting salt

   _____

   _____

Morphology

7. Write the correct word to complete each sentence, adding the suffix *–ment*.

   A. Solving the case was a great _____.
   (amaze, achieve, align, excite)

   B. People had different views on the culprit. It caused great _____.
   (agree, disagree, judge, enforce)

ACTIVITY PAGE 13.1

NAME: _____ **DATE:** _____

8. Write the correct word to complete each sentence:

   A. "I applied three times before I was given _____ to join the fossil dig."
   (admission, permission, remission, emission)

   B. "I _____ that I didn't understand what she was talking about."
   (admitted, emitted, transmitted, permitted)

   C. "Your _____, should you choose to accept it, is . . ."
   (mission, missile, admission, transmission)

NAME:_____ DATE:_____

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ISBN 979-8-89072-704-6

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Printed in the USA

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