STEM 101
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Name: _____
Period: _____

UNIT: FIRST AID

"CREAM CHEMISTRY" – TEMPERATURE AND HEALING REACTIONS

CONCEPT:

Investigating how temperature affects the rate of chemical reactions — like those involved in healing creams or medicines.

MATERIALS:

- ✓ 2 clear plastic or glass cups
- ✓ Alka-Seltzer tablets **(or baking soda + vinegar)**
- ✓ Room-temperature water (~20–22°C)
- ✓ Warm water (~35–40°C — body temp range)
- ✓ Thermometer
- ✓ Stopwatch or timer
- ✓ Measuring cup (for equal water amounts)

STUDENT DIRECTIONS:

Step 1: Measure and Pour Water:

- Pour **equal amounts** (e.g., 100 mL) of water into two separate cups.
- Use the thermometer to check and label each:
  - One should be room temperature (~20–22°C)
  - One should be warm (~35–40°C, similar to body temp)

Step 2: Prepare the Reaction:

- Get **two tablets** of Alka-Seltzer (or prepare equal scoops of baking soda for vinegar test).
- Have your stopwatch ready.

Step 3: Start the Experiment:

- Drop one tablet into each cup **at the same time**.
- Immediately start your stopwatch.
- Observe and **record the time** it takes for each tablet to fully dissolve.

Step 4: Record Observations:

- Note how quickly bubbles appear and disappear.
- Write down how long it takes for bubbling to mostly stop.

Step 5: Repeat if Needed:

- Try again using slightly different water temps (cool, warm, hot) if time allows.
- Compare results to confirm your findings.

Data Table:

Water Temperature	Time to Dissolve (sec)	Bubbling Intensity (low/med/high)
Room Temp (°C)		
Warm (Body Temp)		

Analyze & Reflect:

1. What does a faster reaction (more bubbles, less time) tell you about how temperature affects chemical reactions?

   _____

   _____

2. Which cup showed the fastest and most intense reaction? Why do you think that happened?

   _____

   _____

3. If a healing cream needed body heat to activate its ingredients, which water temp represents the best condition for fast healing?

   _____

   _____

4. How is this experiment similar to what happens inside your body during healing?

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STANDARDS ALIGNMENT

NGSS: HS-PS1-5 **STEL:** STEL 1H, STEL 2H, STEL 4H, STEL 8H, STEL 9J **CCSS:** CCSS.MATH.CONTENT.HSS.ID.B.6, CCSS.MATH.CONTENT.HSF.IF.C.7, CCSS.MATH.CONTENT.HSS.ID.C.9, CCSS.MATH.PRACTICE.MP2, CCSS.MATH.PRACTICE.MP4