STEM 101
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Name: _____
Period: _____

UNIT: FIRST AID

"RESCUE WRAPS" – TESTING COOLING EFFICIENCY OF FIRST AID MATERIALS

CONCEPT:

Investigating how different materials transfer thermal energy and protect injured skin.

MATERIALS:

- ✓ Resealable plastic bag (filled with warm water — this is your "burned skin")
- ✓ Warm water (40–45°C)
- ✓ Ice cubes (1 per trial)
- ✓ Test materials:
  - Wet paper towel
  - Aloe gel
  - Gauze
  - Foil
  - Cloth
- ✓ Digital thermometer
- ✓ Stopwatch or timer
- ✓ Ruler (optional: measure material thickness)

STUDENT DIRECTIONS:

Step 1: Prepare Your Simulated Burn:

- Fill a resealable bag with warm water (~40–45°C).
- Seal the bag tightly — no leaks!
- This simulates burned skin.

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Step 2: Apply the Cooling Material:

- Wrap one test material completely around the bag.
- If using aloe gel, spread a layer over the bag before wrapping.
- Optional: measure and record thickness of the material with a ruler.

Step 3: Add the Ice Cube:

- Place a single ice cube on top of the wrapped "burn."
- Start the stopwatch as soon as the ice is placed.

Step 4: Measure Temperature Over Time:

- Use the thermometer to measure the temperature **inside the bag** every **minute** for **5 minutes**.
- Record your data in the table below. (Slide the thermometer in carefully without opening the bag too much.)

Step 5: Repeat with Other Materials:

- Empty and refill the bag with warm water each time.
- Test all materials using the exact same process.

Data Table:

Material Tested	Start Temp (°C)	Temp @ 1 min	2 min	3 min	4 min	5 min
Wet Paper Towel						
Aloe Gel						
Gauze						
Foil						
Cloth						

Analysis & Reflection:

1. Which material cooled the "burn" the fastest (largest temp drop in 1–2 minutes)?

   _____

   _____

2. Which material kept the temperature more stable over time (slower changes)?

   _____

   _____

3. What physical properties made a material better at transferring or insulating heat? (e.g., thickness, texture, moisture)

   _____

   _____

4. If you were designing a real burn treatment, which material would you recommend and why?

   _____

   _____

STANDARDS ALIGNMENT

NGSS: HS-PS3-4 **STEL:** STEL 1H, STEL 4H, STEL 7J, STEL 8H, STEL 11H **CCSS:** CCSS.MATH.CONTENT.HSS.ID.A.1, CCSS.MATH.CONTENT.HSS.ID.B.6, CCSS.MATH.CONTENT.HSA.CED.A.2, CCSS.MATH.PRACTICE.MP4, CCSS.MATH.PRACTICE.MP2