STEM 101
Powered by THE STEM ACADEMY

Name: _____
Period: _____

UNIT: FIRST AID

"FIRST AID FAR FROM HOME" – DESIGN A SURVIVAL WRAP KIT

SCENARIO:

You're designing a First Aid Cooling Kit for either astronauts in space or explorers stranded in the wilderness. There's no hospital nearby—so your materials need to work fast, be safe, and last.

CHALLENGE GOAL:

Design and present a **burn-care first aid kit** that works in **extreme or isolated environments**, such as:

- Aboard a spacecraft or lunar base
- Deep wilderness without medical support

You will work in small teams to research, plan, and **present your design**.

STUDENT DIRECTIONS:

Step 1: Choose Your Environment

As a team, pick one:

- Space (zero gravity, very cold/hot extremes, limited water, no gravity)
- Wilderness (variable temperatures, lots of movement, no electricity)

Think about what survival would look like in this setting.

Step 2: Identify Needs

List the challenges you must solve:

- How will your wrap cool a burn quickly?
- Will it **stay in place** during movement?
- Can it be **reused**?
- What if there's **no freezer or cold water** available?

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Record your key design needs:

_____

_____

Step 3: Select Materials

Brainstorm materials you could **realistically pack or find**:

- Lightweight cloth
- Aluminum foil
- Gel packs
- Natural sponges
- Self-heating or self-cooling compounds
- Water-absorbing polymers
- Sterile wipes or single-use wraps

What properties are important in your material choices?

Property	Why It's Important for First Aid
Thermal Conductivity	Helps draw heat away from the skin
Reusability	Saves space and weight in survival gear
Safety & Comfort	Safe to use on human skin; no extra damage
Ease of Use	Simple, fast to apply under pressure

Step 4: Draw and Describe Your Kit

Use a half-page to:

- Sketch your survival wrap and label the materials
- Explain how it cools burns
- Describe how it's stored and applied
- Include how long it lasts or how it's reused

Sketch Space (or use notebook):

Step 5: Justify Your Choices

Answer the following as a team:

1. Why are your materials effective for this environment?

   _____

   _____

2. What trade-offs did you make (e.g., comfort vs. reusability)?

   _____

   _____

3. How does your design support patient comfort and healing?

   _____

   _____

4. If you could only carry 3 items, which would they be and why?

   _____

   _____

Group Presentations:

Present your First Aid Kit concept to the class. Focus on:

- Science behind your design
- Why it works in your chosen setting
- How you balanced effectiveness, simplicity, and safety

STANDARDS ALIGNMENT

NGSS: HS-PS3-4, HS-ETS1-2 **STEL:** STEL 1H, STEL 2H, STEL 4H, STEL 8H, STEL 9J, STEL 11H **CCSS:** CCSS.MATH.CONTENT.HSM.1F.C.7, CCSS.MATH.CONTENT.HSG.MG.A.3, CCSS.MATH.PRACTICE.MP2, CCSS.MATH.PRACTICE.MP4, CCSS.MATH.PRACTICE.MP5