UNIT: JCI BUILDING SYSTEMS

INSULATE IT!

Your Mission:

You’re on a Heat Shield Challenge! Your task is to protect the inside of a box from getting too hot. Use your science skills to design, build, and test an insulated box that can block out heat like a pro. Ready to keep things cool? Let’s go!

GOAL: Use insulation to reduce how much heat gets into your box.

Materials:

* 1 small box (tissue box or shoebox)
* Foil, felt, paper, cotton balls (for insulation)
* Plastic wrap or clear lid
* Tape, scissors
* Small thermometer (strip or digital)
* Heat lamp or flashlight with warm bulb
* Timer

STUDENT DIRECTIONS:

**Step 1: Plan Your Design**

* Think about how to block heat from entering the box.
* Choose 2 or 3 insulation materials (like foil to reflect heat or cotton to trap it).
* Give your box a name! Example: *“Cozy Box”*

**Step 2: Build Your Insulated Box**

* Line the inside of the box with your chosen insulation materials.
  + You can tape felt to the walls, press cotton balls in the corners, or wrap foil inside.
* Cover the top of the box with plastic wrap or a clear lid — this is your “window.”
* Tape it down tightly so warm air can’t escape or enter easily.

**Step 3: Take Temperature Readings**

* Place the thermometer inside the box, on the floor or taped to a wall.
* Record the start temperature before adding heat.

**Step 4: Heat It Up**

* Place your box under a heat lamp or close to a flashlight with a warm bulb.
* Make sure the light is shining through the plastic “window.”
* Start the timer and leave it for 10 minutes.
* Record the end temperature after time is up.

Standards Alignment

NGSS: 4-PS3-2, 4-PS3-4STEL**:** STEL 1B, STEL 2A, STEL 4A, STEL 4B, STEL 6A, STEL 7B, CCSS: CCSS.MATH.CONTENT.3.MD.A.1, CCSS.MATH.CONTENT.3.MD.B.3, CCSS.MATH.CONTENT.4.MD.A.2, CCSS.MATH.CONTENT.5.MD.A.1