



PUZZLE: BUILD A HANDS-FREE EGG CARRIER TO HELP COLLECT EGGS

STANDARDS & CONNECTIONS: NGSS.3-5-ETSI, NGSS.MS-ETSI

SUGGESTED MATERIALS: Egg cartons, ribbon, string, tape, rubber bands, wide popsicle sticks, flat foam pieces

BACKGROUND: There are eight steps to get eggs from the farm to your table: laying, collecting, washing, candling, storing and packing, shipping, selling and storing, and enjoying. Female chickens, hens, lay their eggs in either a hen house or outside. Larger chicken farms can have thousands of eggs to collect in a day, so they rely on automated gathering belts which help them collect eggs. Some smaller farms still gather eggs by hand.¹ It's important to collect eggs in a timely manner to lower the risk of them getting broken. If the eggs are cracked or broken, they can't be sold.

1. IDENTIFY: Share the background information with the students, then share the puzzle to be solved. Determine constraints (e.g., time allotted, space, materials provided, etc.) and divide students into small groups.

2. IMAGINE: Ask a series of questions to help students brainstorm solutions to the puzzle. Encourage students to list all ideas – don't hold back! Before moving on, make sure each group selects a solution that fits within the constraints.

- Ask: *How can you solve this puzzle? Which of your ideas can you build a prototype for given the constraints?*

3. DESIGN: Students diagram the prototype, identify the materials needed to build the prototype, and write out the steps to take. Students describe the expected outcomes.

- Ask: *What steps will you take to create your solution? What do you expect your solution to look like and be able to do?*

4. CREATE: Students follow their design plan and build their prototypes. Monitor their progress and remind them about how much time they have.

5. TEST & IMPROVE: Students evaluate their creation and compare it with the expected outcomes. Students seek areas of improvement and make changes where needed.

6. SHARE: Students share their solution to the puzzle and communicate lessons learned.

- Ask: *What was your biggest takeaway? What would you do differently?*

ADDITIONAL RESOURCES: For more background information on this topic, please visit www.purpleplow.org.



Put eggs or rocks outside on a lawn. Time students to see how well and efficient their egg-carriers work.

¹ American Egg Board. (2018). *On the farm*. Retrieved from: <https://www.incredibleegg.org/where-eggs-come-from/>