



## PUZZLE: CREATE A MAP OF MONARCH BUTTERFLY MIGRATION PATTERNS

**STANDARDS & CONNECTIONS:** NGSS.3-5-ETSI, NGSS.MS-ETSI, CCSS.ELA-LITERACY.SL.9-10.4

**SUGGESTED MATERIALS:** Variety of paper, colored markers/pens, access to the internet, glue

**BACKGROUND:** The annual migration of North America's monarch butterfly is a unique and amazing phenomenon. The monarch is the only butterfly known to make a two-way migration as birds do. Unlike other butterflies that can overwinter as larvae, pupae, or even as adults in some species, monarchs cannot survive the cold winters of northern climates. Using environmental cues, the monarchs know when it is time to travel south for the winter. Monarchs use a combination of air currents and thermals to travel long distances. Some fly as far as 3,000 miles to reach their winter home! Monarchs can travel between 50-100 miles a day; it can take up to two months to complete their journey. The farthest ranging monarch butterfly recorded traveled 265 miles in one day. Monarchs in Eastern North America have a second home in the Sierra Madre Mountains of Mexico. Monarchs in Western North America overwinter in California.<sup>1</sup>

**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](http://www.purpleplow.org).



Do you live near a migration pathway? Take a trip to visit a monarch butterfly reserve near you!

<sup>1</sup> USDA Forest Service. (n.d.). *Migration and overwintering*. Retrieved from [https://www.fs.fed.us/wildflowers/pollinators/Monarch\\_Butterfly/migration/index.shtml](https://www.fs.fed.us/wildflowers/pollinators/Monarch_Butterfly/migration/index.shtml)