



## PUZZLE: BUILD A HOME FOR MASON BEES

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

**SUGGESTED MATERIALS:** Small wood pieces, newspaper, cardboard, string, pine cones, sticks

**BACKGROUND:** Bees have a big job in agriculture because they help pollinate plants. Pollination is the transfer of pollen from the male parts (stamen) of the flower to the female parts (pistil). The result of pollination is a fertilized plant that can now produce the many crops that we enjoy such as almonds, watermelon, and apples. Bees fly flower to flower collecting nectar and gathering pollen on their body and legs. As they travel, they end up brushing the pollen onto the stigma.<sup>i</sup> One type of bee is the Mason bee. They are solitary bees, meaning they don't live in hives with other bees. Instead, they find crevices in trees or rocks to live by themselves and build nests.<sup>ii</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).



Have students take their bee hotels home and hang or place them somewhere conducive for Mason bees.

<sup>i</sup> Michigan State University. (n.d.). *Pollination*. Retrieved from: <https://www.canr.msu.edu/nativeplants/pollination/>

<sup>ii</sup> Penn State Extension. (2015, August 12). *So what is a mason bee?* Retrieved from: <https://extension.psu.edu/programs/master-gardener/counties/luzerne/news/2015/so-what-is-a-mason-bee>