TOPIC 5
Piecewise Functions

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Activity

enVision™ STEM Project

Overview of the Project

In this project, students learn about insect populations that have cyclical "booms" and "busts," most notably the cicada, whose adult population booms every 17 years.

Introducing the Project

Present the situation by discussing *why* this population booms and busts, while other species' populations are more stable. (In part, the next generation's population depends on the environment's carrying capacity and the species' rate of reproduction.)

The questions below can be used to guide the discussion.

Q: What are some examples of insects that are always around?
[Expect students in urban, suburban, and rural areas to have different answers. Samples: ants, spiders]

Q: What are some examples of insects that are sometimes, but not always, around?
[Expect students in urban, suburban, and rural areas to have different answers. Samples: butterflies and moths, bees, cicadas]

Q: Cicadas [si-KAY-dahs] are insects that spend many years underground before emerging in large groups, or *broods*. Some broods emerge every 13 years while some emerge every 17 years. What do you think would happen if a 13-year brood and a 17-year brood emerged the same year?
[There will be intense competition for food and other resources.]

Have students read the task they will be asked to complete.

Implementing the Project

Show the Topic 5 STEM video to generate interest in the project.

You can download blackline masters for use with the project from the Teacher Resource Center.

Finishing the Project

You may wish to plan a day when students share their completed projects. Encourage students to explain their process as well as their results.

MAKING MATHEMATICAL CONNECTIONS	
In Topic 3 …	… you used linear functions to determine recycling rates.
In this Topic …	… you analyze piecewise functions to model insect populations.
In Topic 7 …	… you will use polynomials to model business decisions.

AVAILABLE ONLINE

NG Next Generation Science Standards HS-ESS3-6, HS-LS2-1, HS-LS2-2