Math Snacks: Game Over Gopher

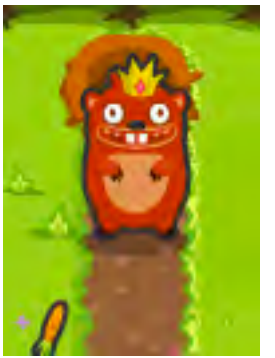
Game Over Gopher is a fun, fast-paced game that guides students in reading coordinate pairs and plotting numbers, differentiating negative coordinates from positive coordinates, and identifying the four quadrants. It helps establish the fundamentals of plotting functions on a grid. We recommend it for students who are struggling to understand the coordinate grid or those who just want to become more comfortable with plotting. It can be used as an introduction to the topic.

Note that, depending on your internet connection speed, the game might take several minutes to load. As the game loads, the gopher image will get progressively more complete.

How to Play

Your goal is to keep your prize carrot from being eaten by space gophers.

The Prize Carrot



Space Gopher

To defend your prize carrot, you must select various tools to “feed” the space gophers that are trying to eat the prize carrot. If they fill up on regular carrots, corn, cranberries, and other produce, they won’t eat the prize carrot.

Once the game is loaded, you'll see the Title Screen. Click "New Game":

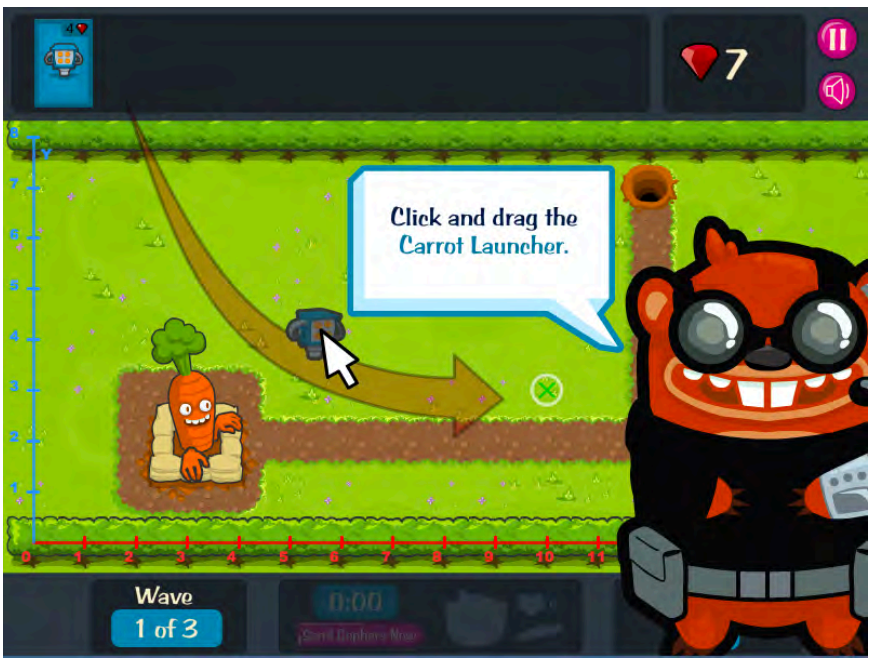
Level 1:

Click the glowing monitor to go to Level 1:

The prize carrot peeks out of its hole, and a space gopher arrives with a series of instructions. Click the Continue button to progress through the gopher's instructions.

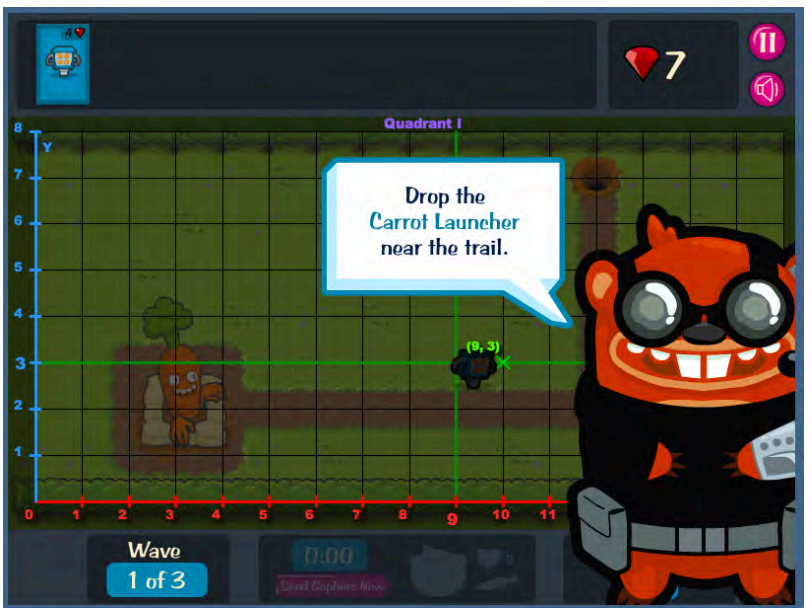
A new space gopher arrives to demonstrate how to click and drag a Carrot Launcher. (Carrot Launchers launch small carrots to feed the space gophers and keep them away from the prize carrot.)

You must click and drag the carrot launcher onto the green X on the lawn (inside the blinking white circle) in order to proceed.



As you drag the Carrot Launcher, a coordinate grid will appear superimposed on the game board. You must drop the carrot exactly at the given position—which will always be (10,3) for this tutorial. Dropping the Carrot Launcher anywhere else on the screen won't work.

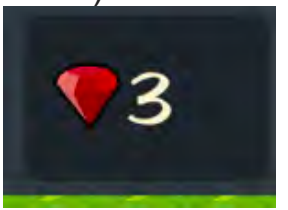
As you drag the Carrot Launcher around the board, notice that the Carrot Launcher's coordinate position--for example (1,7) or (4, 3)-- is dynamically shown on the screen.

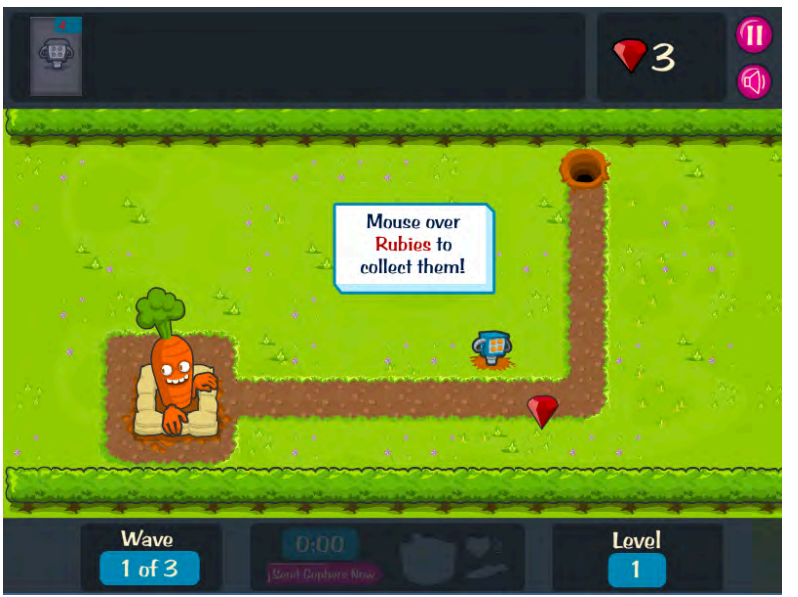


Once the Carrot Launcher is placed, the coordinate grid overlay disappears, and a space gopher pops out of the gopher hole and follows the dirt trail toward your prize carrot. The Carrot Launcher will automatically start firing carrots at the gopher. **Do not click the Carrot Launcher to launch carrots!** In fact, clicking the Carrot Launcher will open a small box around the launcher that, at this point, is not needed and will simply get in the way. When the gopher has eaten enough carrots, he gets fatter and transforms into a ruby.

Notice that the carrot launcher icon in the top left of the screen is sometimes grayed out. That tells you that there are no more carrot launchers available for you to place right now.

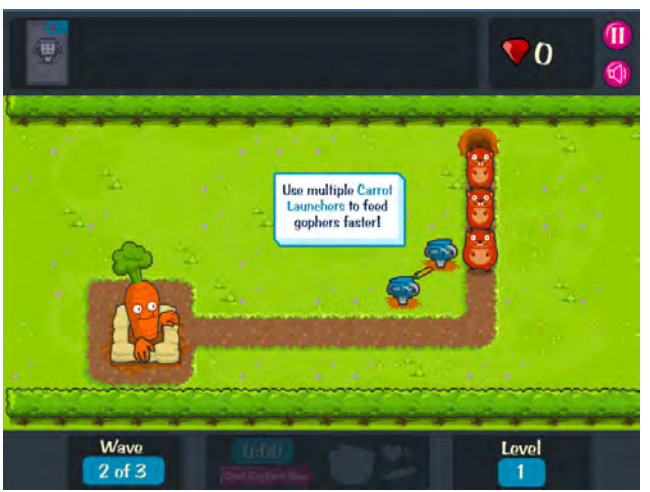
Back in the game board, mouse over the ruby to collect it. Rubies let you buy more carrot launchers (and eventually, other tools as well). You need four rubies to buy a Carrot Launcher. The game gave you some rubies to start with (as shown in the upper right of the screen).



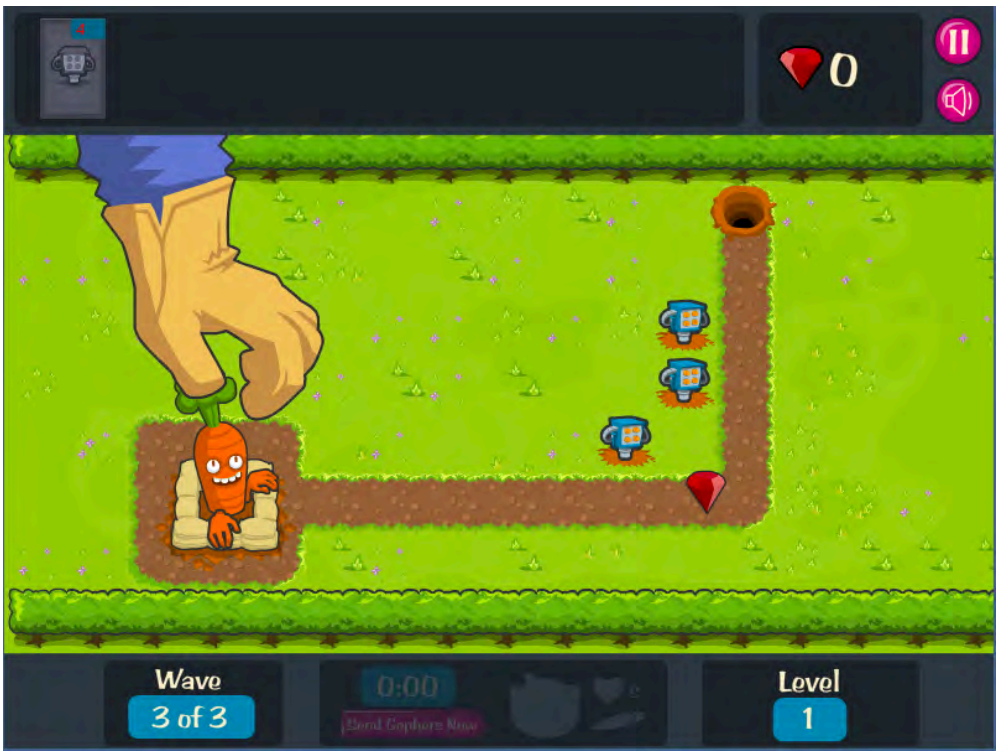


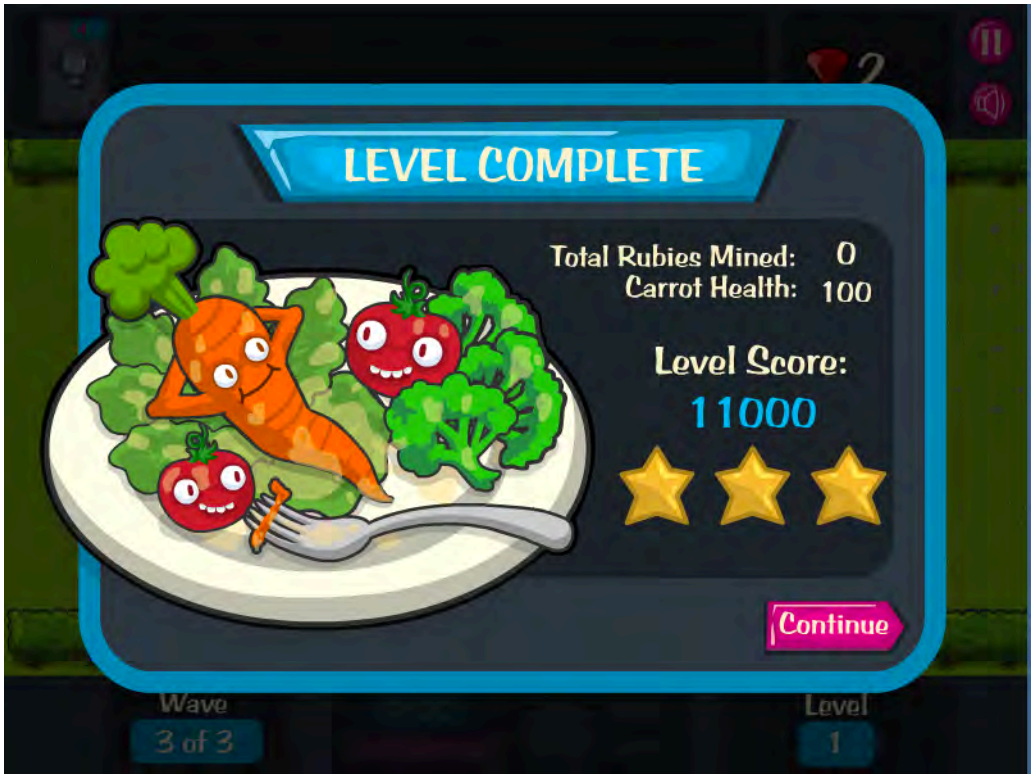
Once you've gathered the ruby, you have a total of four rubies, so you have enough to buy another Carrot Launcher; the Carrot Launcher icon becomes colored again, and you can now drag it onto the game board.
Note that you cannot drop a carrot launcher on the dirt path. It can only be placed on the green lawn. In this level, the "X" on the screen and the coordinate grid both guide you to place the Carrot Launcher at position (11,4). Once you get beyond Level 1, you can place the Carrot Launcher anywhere there is available space on the green lawn.

As the game progresses, you will need lots of Carrot Launchers, because the space gophers are going to start coming on faster and in greater numbers:

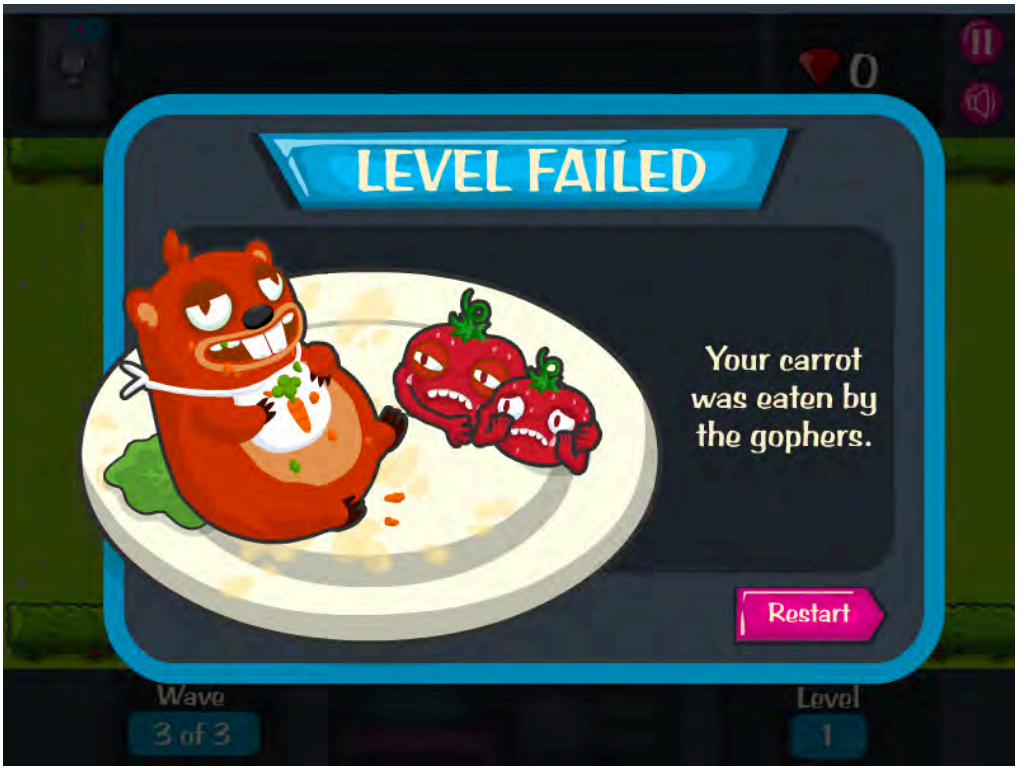


If the gardener’s glove comes into the screen to harvest the prize carrot, you complete the level!



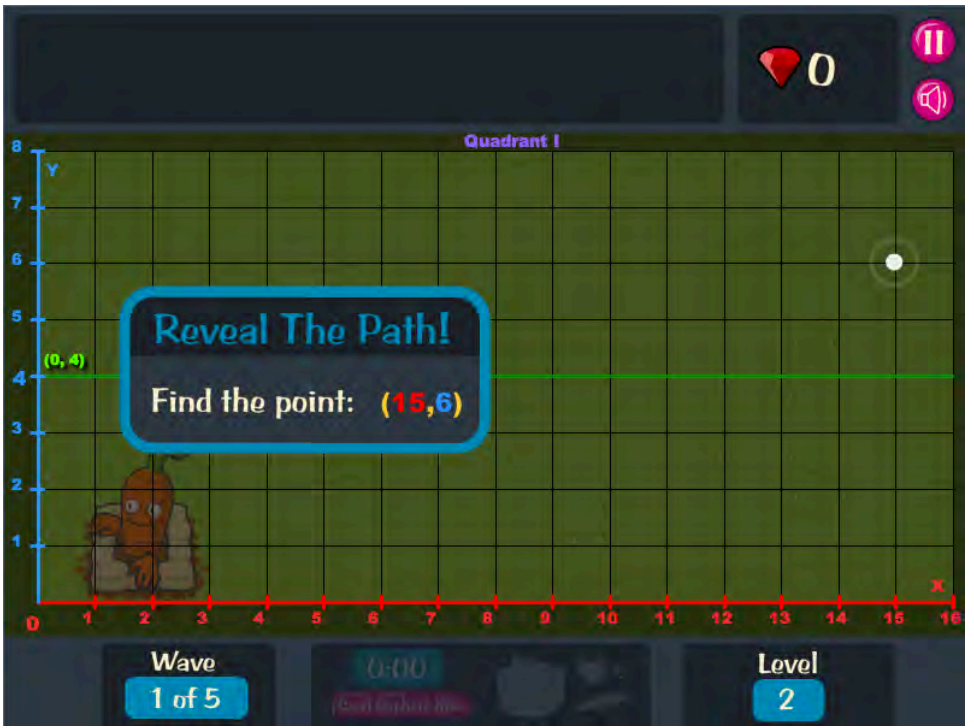

LEVEL COMPLETE
Total Rubies Mined: 0
Carrot Health: 100
Level Score:
11000
Continue
Wave
3 of 3
Level
1

But if several space gophers make it to the prize carrot and take too many bites out of it, you'll fail the level:



Level 2:

This level starts with a tutorial for finding specific points on the coordinate plane. Click the white target at (15,6), then (2,6), then (2,1).

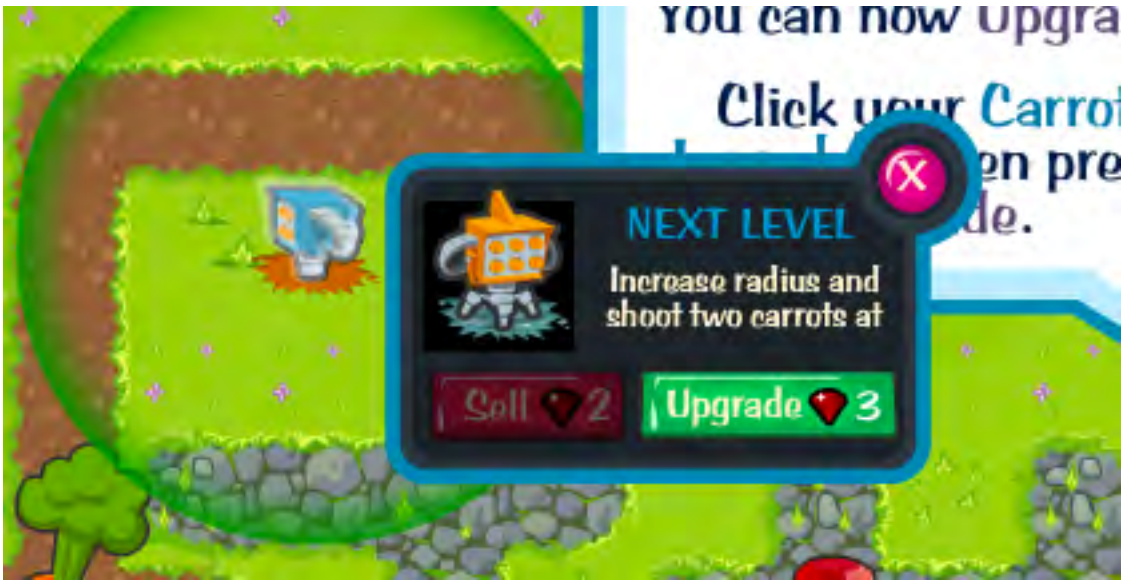


Then the instructions show you how to place a Ruby Drill. Ruby Drills churn out rubies that you can use to buy Carrot Launchers, but each drill comes with a specific set of coordinates. If the Ruby Drill is not placed onto the correct coordinates on the screen, it won't work.

Click “Next,” place your Ruby Drill at the given location (8,2), then gather the ruby that pops out. Now you have enough rubies to place another Carrot Launcher, and the game resumes. Here come the gophers!

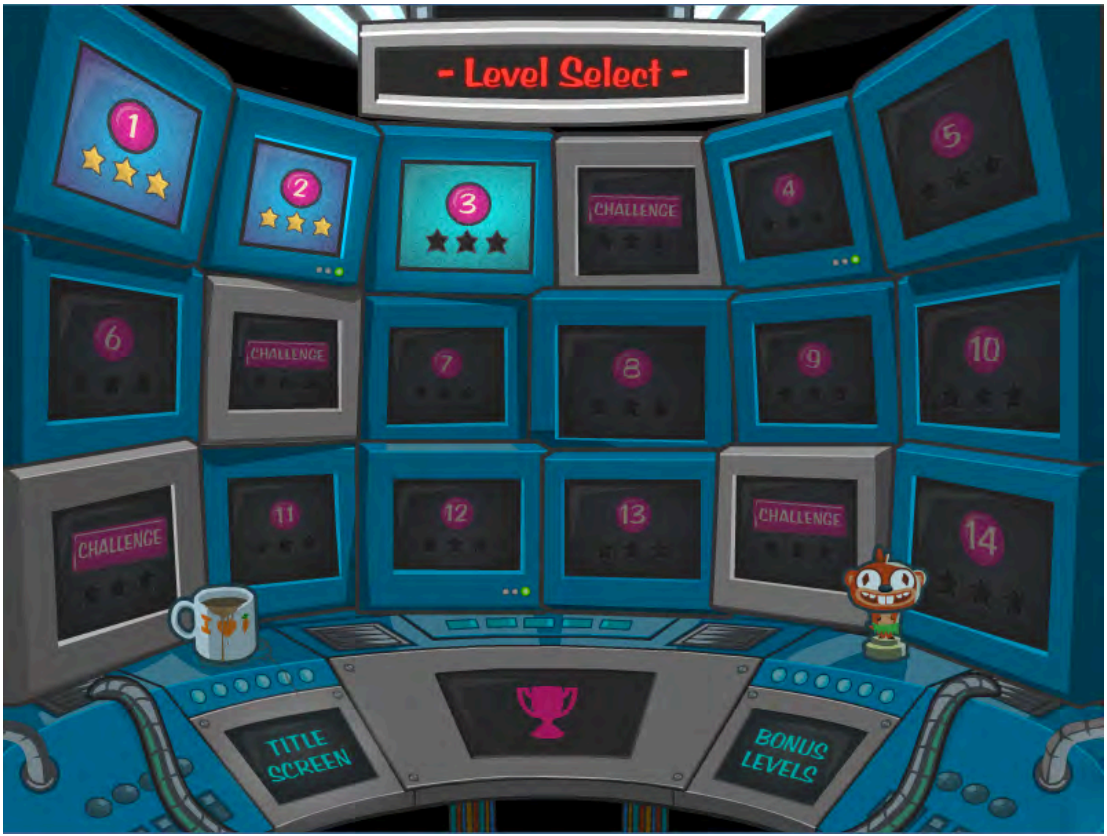
Just like the Carrot Launchers, the Ruby Drills are grayed out when there are none available to place:

Once you gather enough rubies, you'll be shown how to upgrade your Carrot Launcher (so that it launches twice as many carrots) by clicking the Carrot Launcher and then clicking "Upgrade":

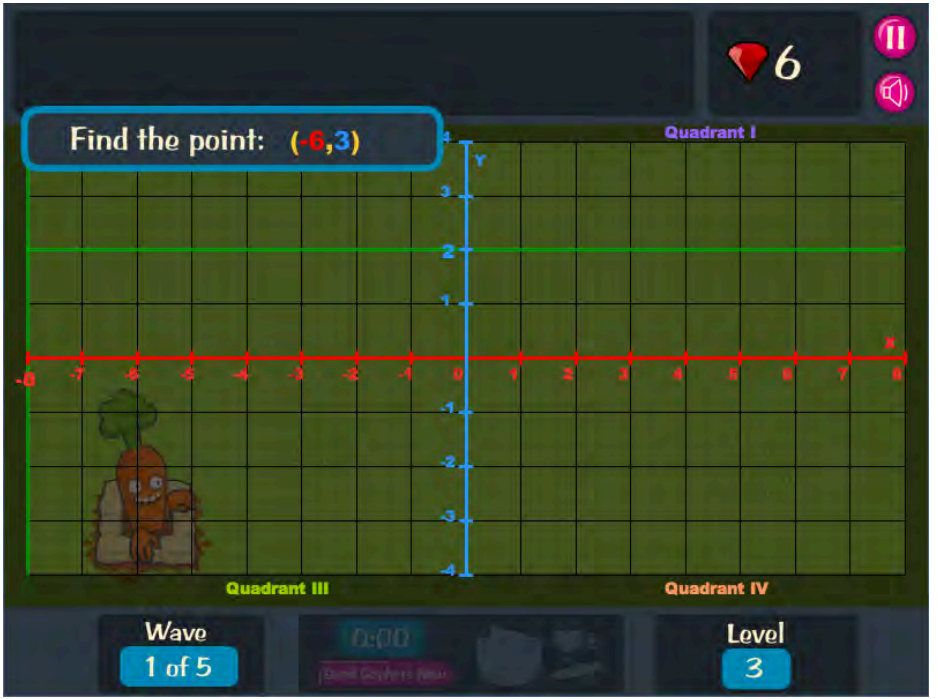


Note that the upgrade will cost you three rubies. Better get more Ruby Drills placed!

Level 3:

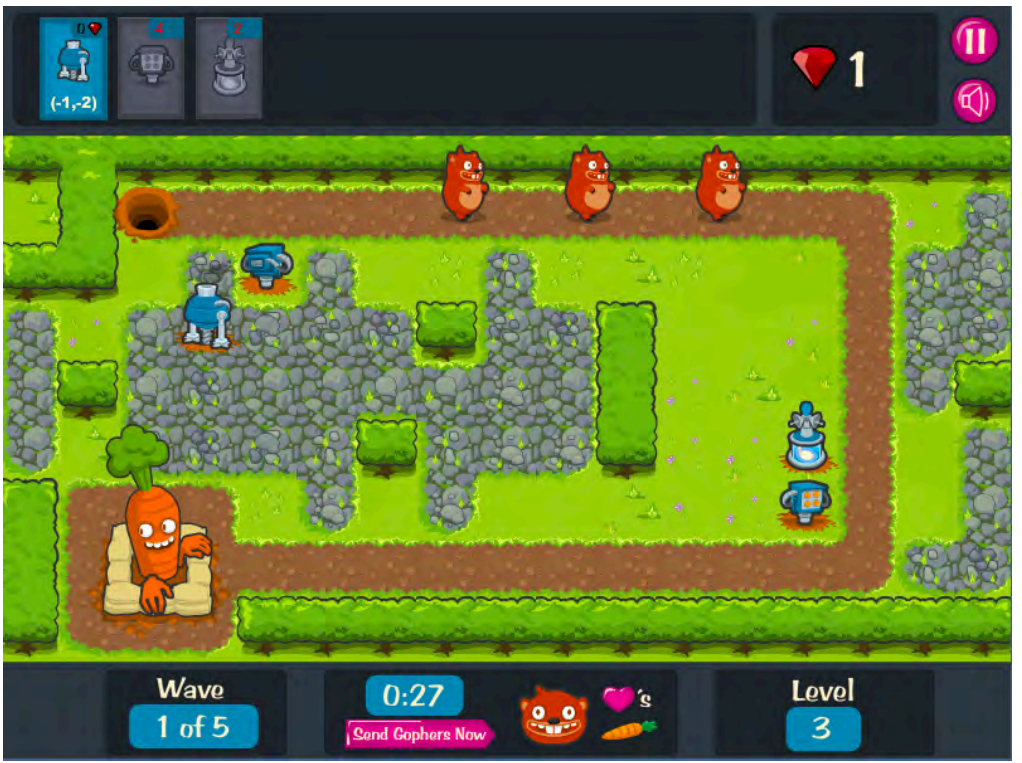

- Level Select -
1
2
3
CHALLENGE
4
5
6
CHALLENGE
7
8
9
10
CHALLENGE
11
12
13
CHALLENGE
14
TITLE SCREEN
BONUS LEVELS

Level 3 expands the coordinate grid into all four quadrants. You must find points with negative numbers, and are no longer given the white target; you must find the point without help. You will earn four rubies as you find the four points.

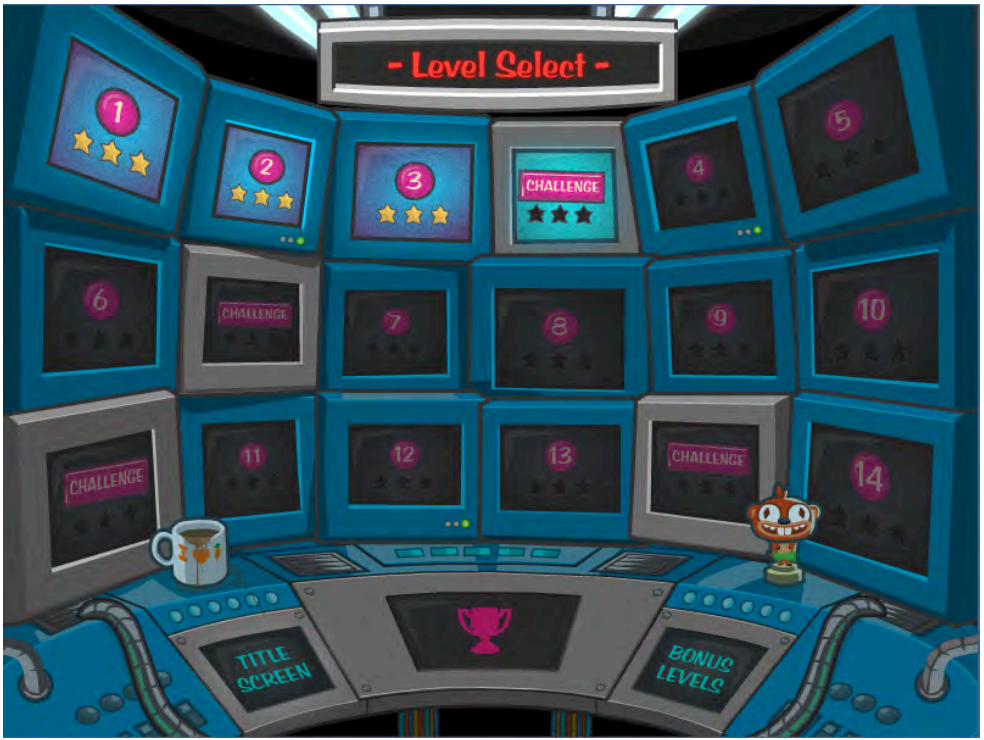


Once you've located the four points, you'll be introduced to a new tool: the Garlic Ray. Garlic Rays slow the gophers and cost two rubies.

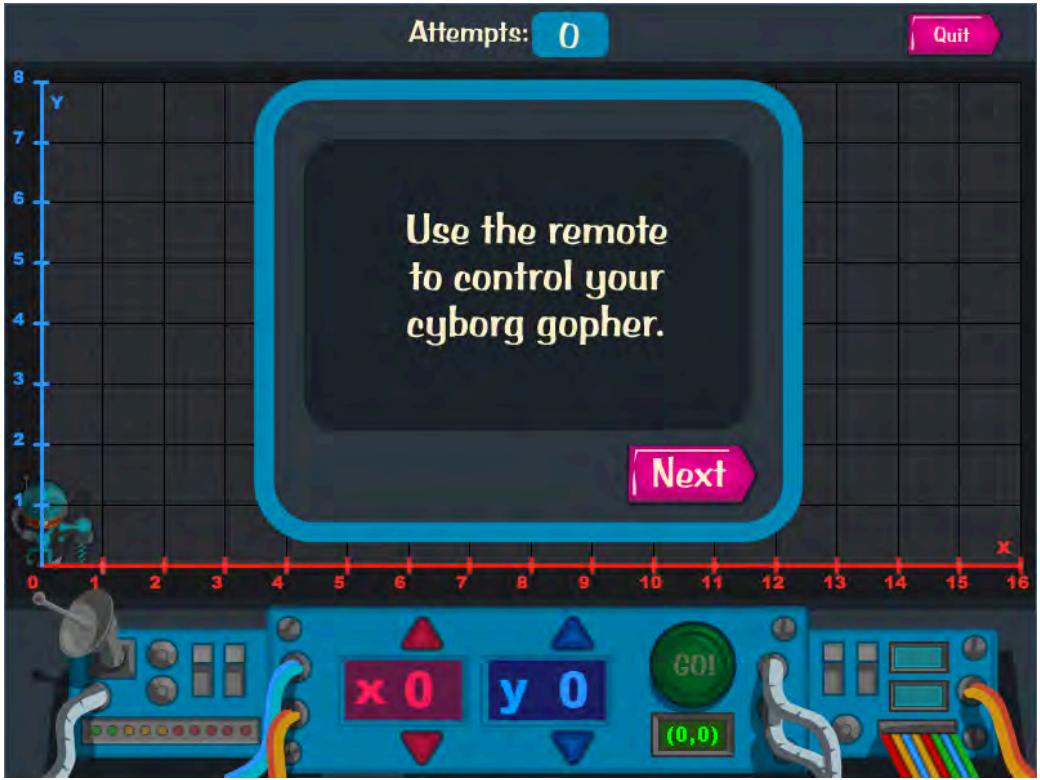
You'll have 30 seconds to place as many Carrot Launchers, Ruby Drills, and Garlic Rays as possible before the next wave of gophers comes marching along. You can continue to place more of them (as you earn them) as the gophers march.



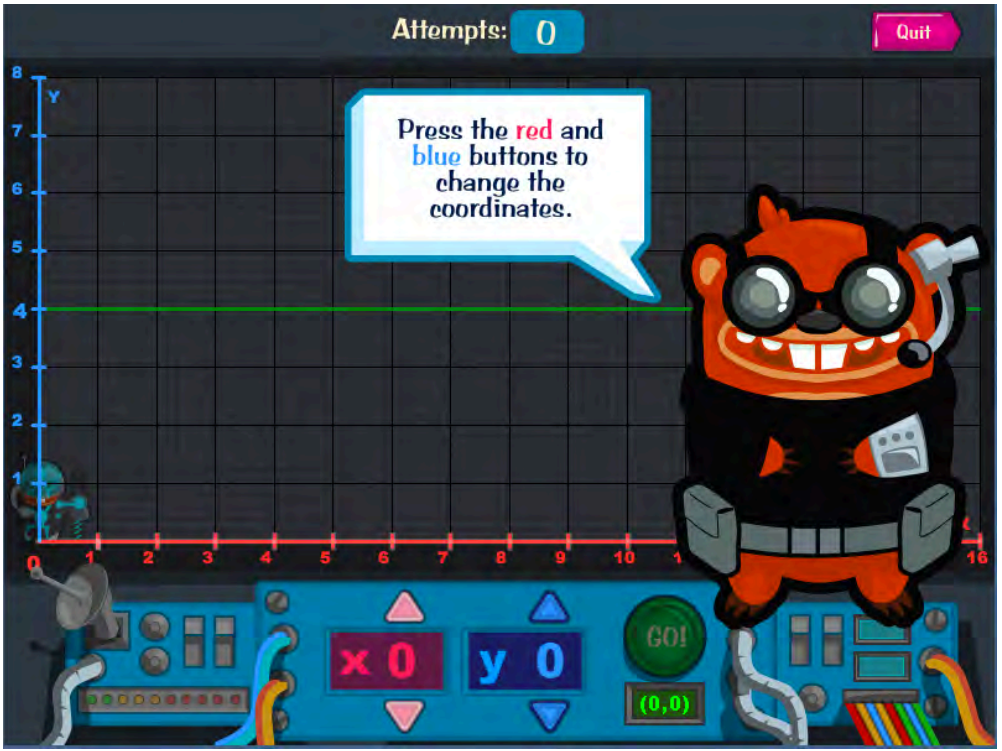
Challenge Level:



The Challenge levels have you drilling for hidden treasure. Follow the onscreen instructions to begin:

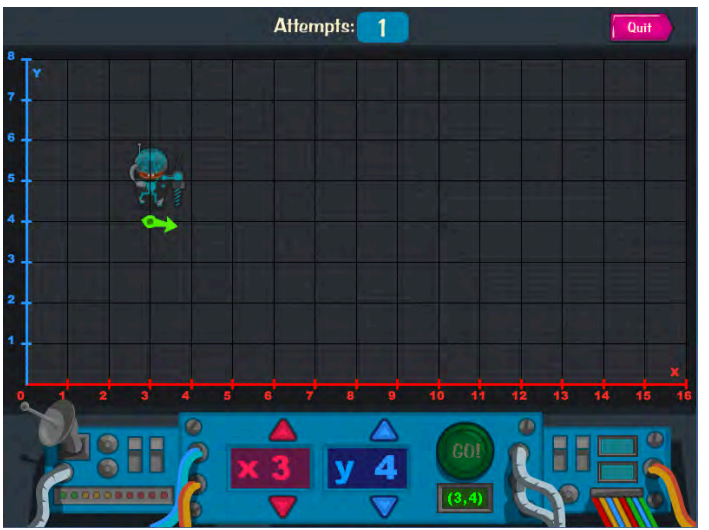

Attempts: 0
Quit
Use the remote to control your cyborg gopher.
Next
Y
X
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
1 2 3 4 5 6 7 8
x 0
y 0
GO!
(0,0)

Attempts: 0
Quit
Y
X
The data may be anywhere.
Make a guess!
Next
x 0
y 0
GO!
(0,0)



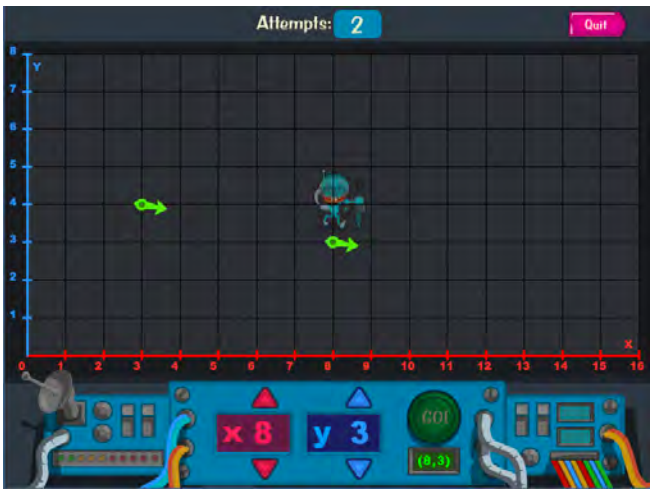
The red and blue controls are shown at the bottom of the screen. They allow you to set a coordinate on the grid.

Set your coordinates, then click the green “Go” button. The cyborg gopher marches to your coordinate, then drills. Unless you make a lucky guess and find the treasure on the first try, you’ll get an arrow pointing you toward the treasure:

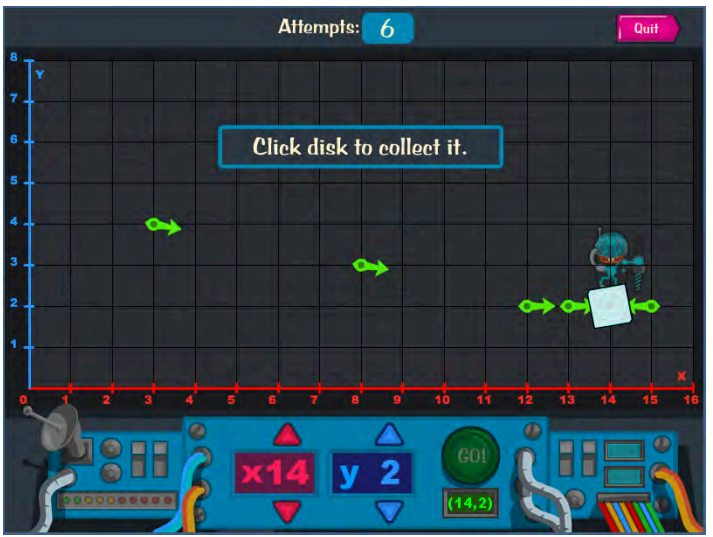


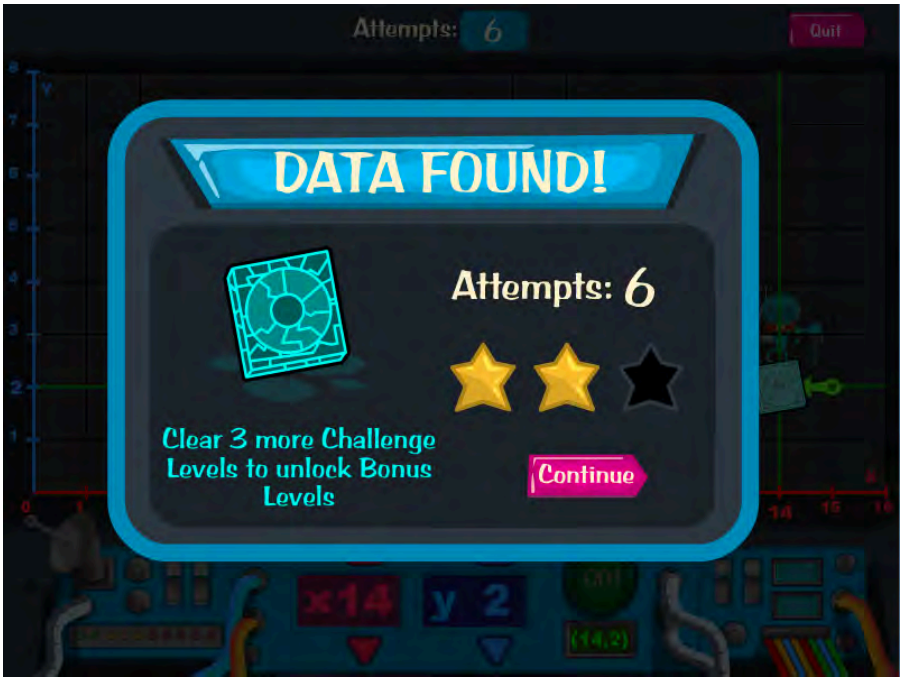
Make another guess by setting a new coordinate in the area where the arrow is pointing, then click “Go”:

Keep following the arrows:



and keep guessing again until you uncover the hidden treasure:

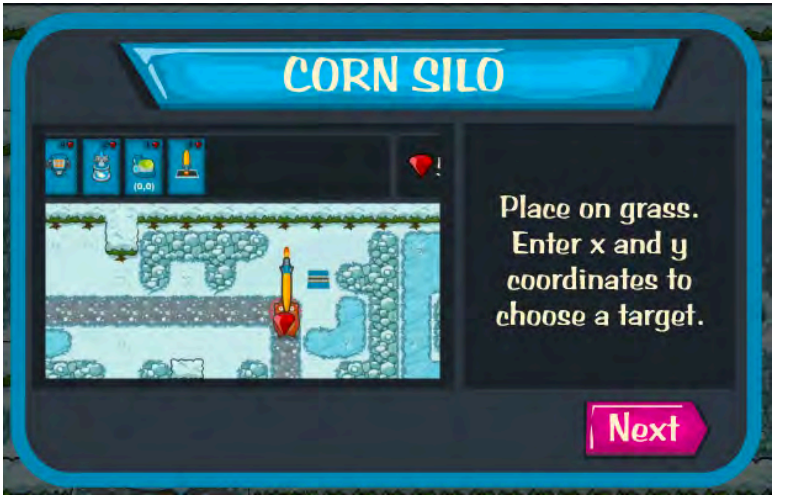



Attempts: 6
Quit
DATA FOUND!
Attempts: 6
Clear 3 more Challenge Levels to unlock Bonus Levels
Continue
x14
y 2
(14,2)

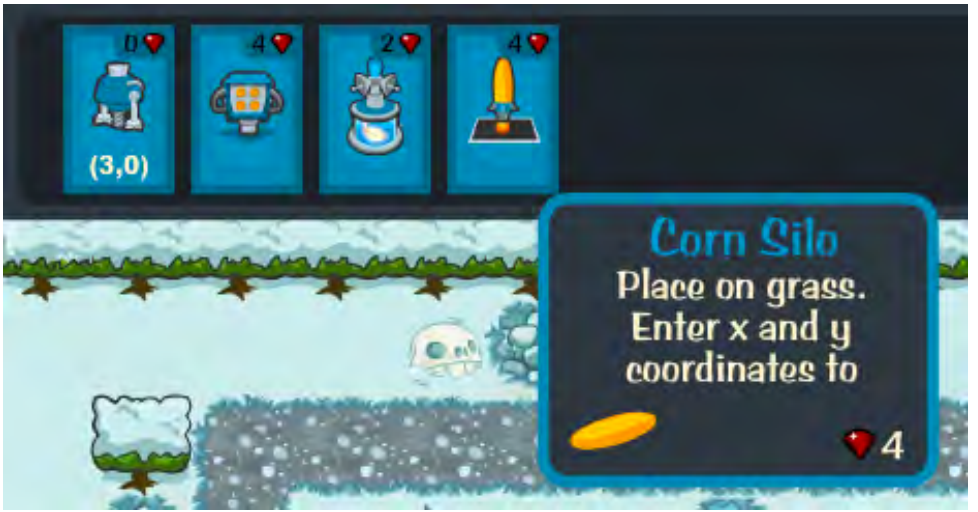
Level 4:

- Level Select -
1
2
3
CHALLENGE
4
5
6
CHALLENGE
7
8
9
10
CHALLENGE
11
12
13
CHALLENGE
14
TITLE SCREEN
BONUS LEVELS

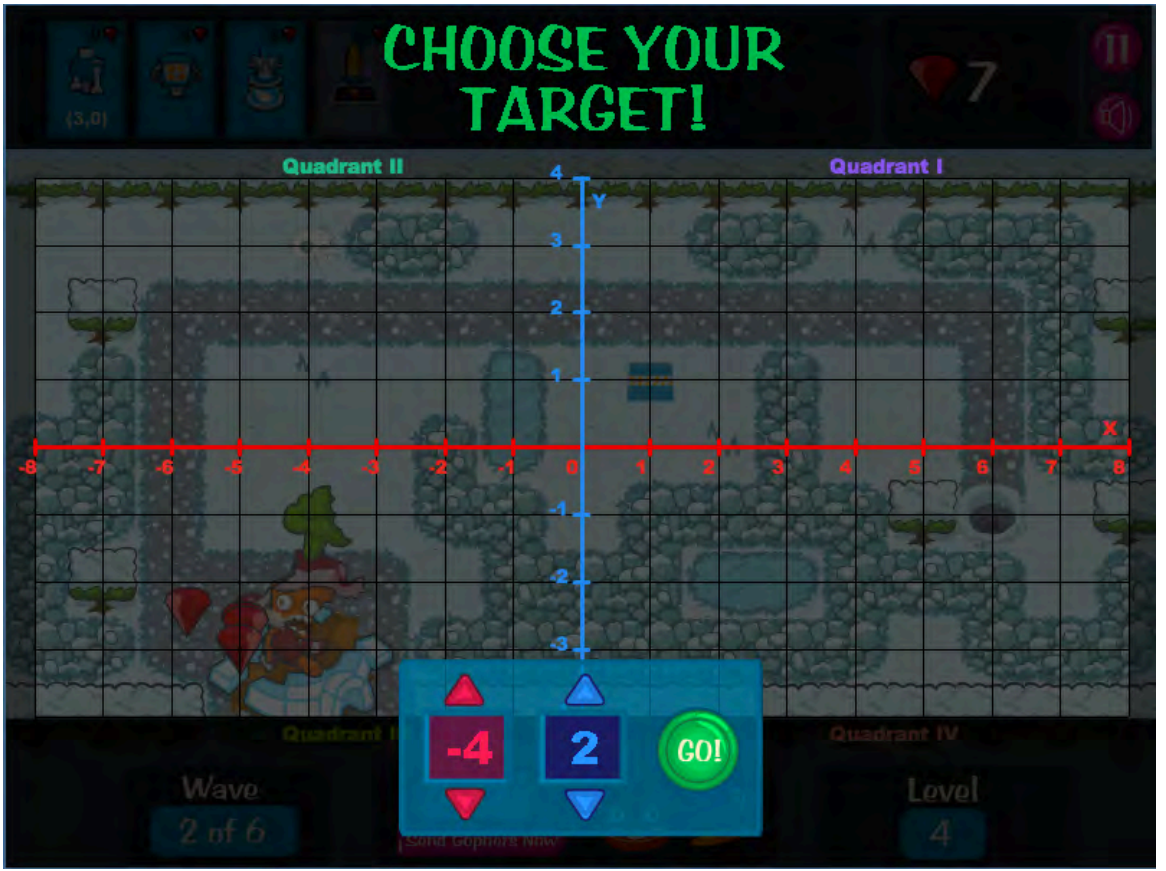
To begin Level 4, you need to find points on the coordinate grid, then follow the instructions to go up, left, down and right by a certain amount. Then you are introduced to a new tool, the Corn Silo.



The Corn Silo launches ears of corn, which you set to land at certain points on the coordinate grid. The launched corn helps feed the gophers. Notice that as you gather new tools with each level, they get added to the Toolbox area in the upper left of the screen.

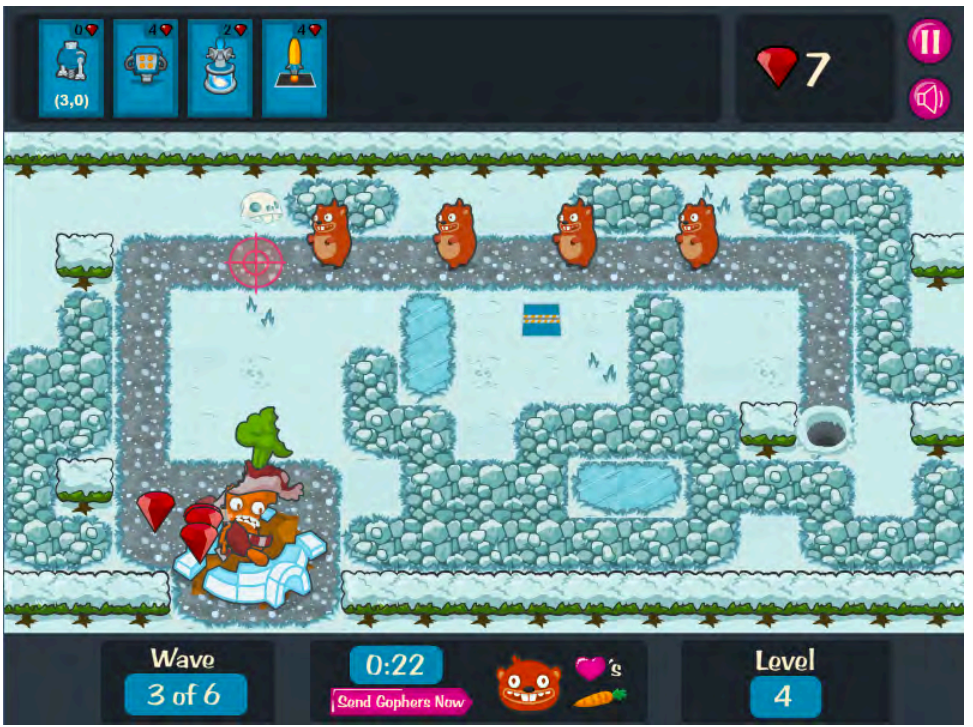


Drag a Corn Silo onto the game board, then set the coordinates where you want the corn to land. It should be somewhere along the dirt path so that it lands on the gophers as they go marching past.

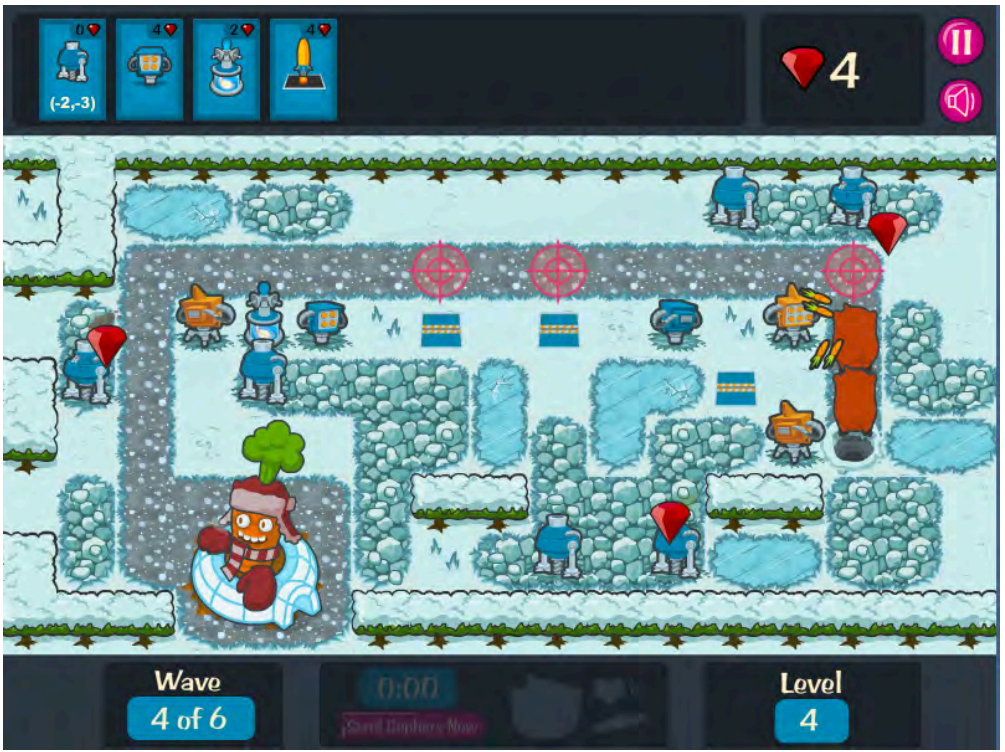


Press “Go!” and the Corn Launcher target will show up in the path at the coordinate you set.

Note that the Corn Silo tool temporarily halts the game to give you time to set the coordinates of the corn target (that is, the coordinates where the launched corn will land).

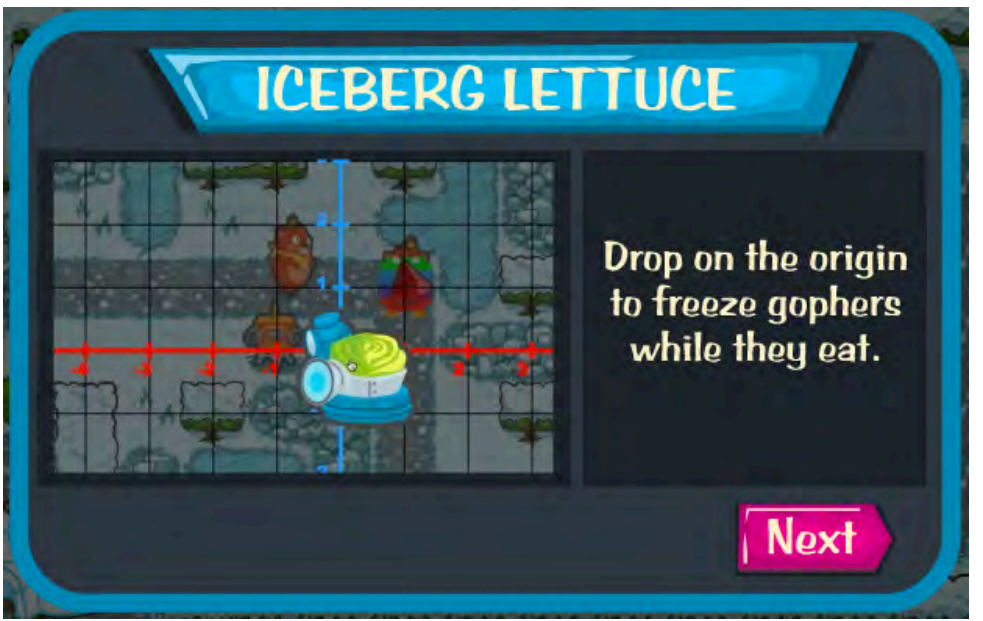


You'll still need to place Ruby Drills, Carrot Launchers, and Garlic Rays to defeat the gophers. You can mix and match your tools however you like with however many rubies you have to spend. The screen image below shows one of numerous ways the board might look after several minutes of play:

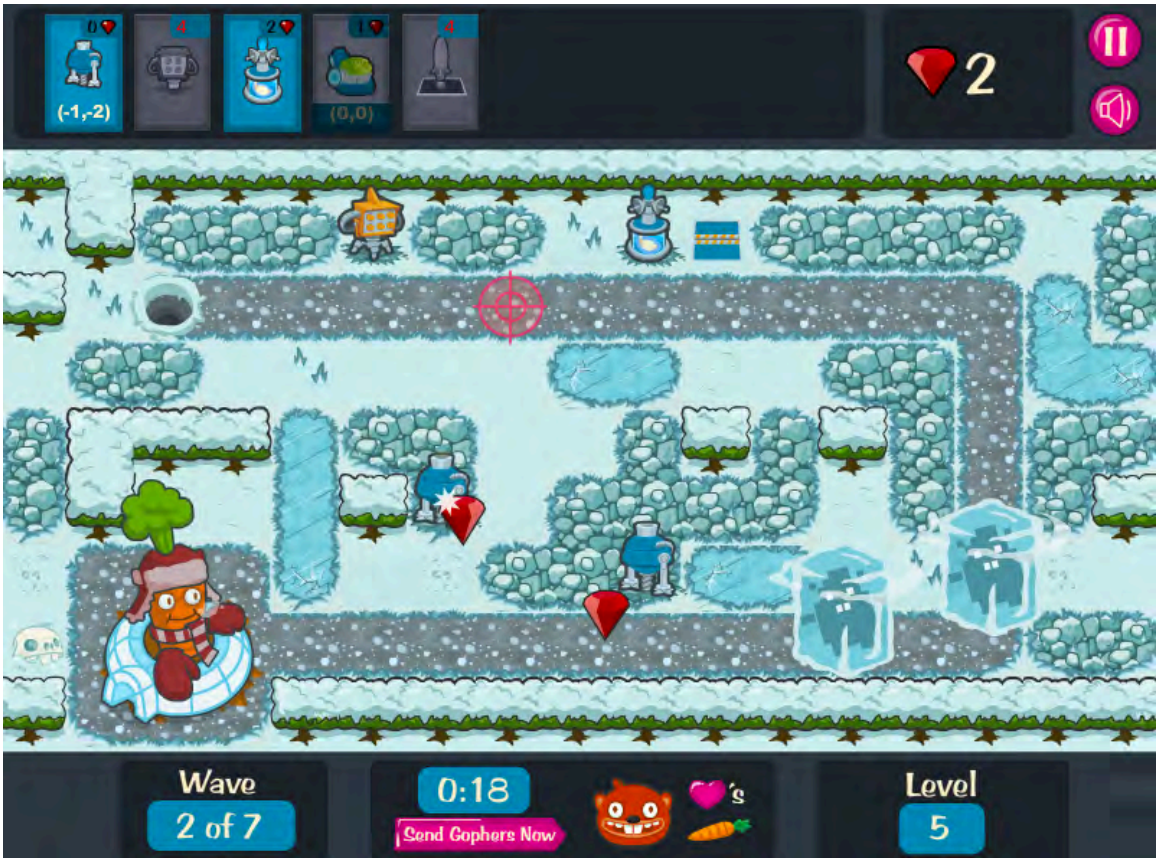


Level 5:

Level 5 introduces the Iceberg Lettuce tool, which freezes the gophers, giving you more time to feed them before they reach your prize carrot. Iceberg Lettuce must always be dropped on the origin—position (0,0) on the coordinate grid.

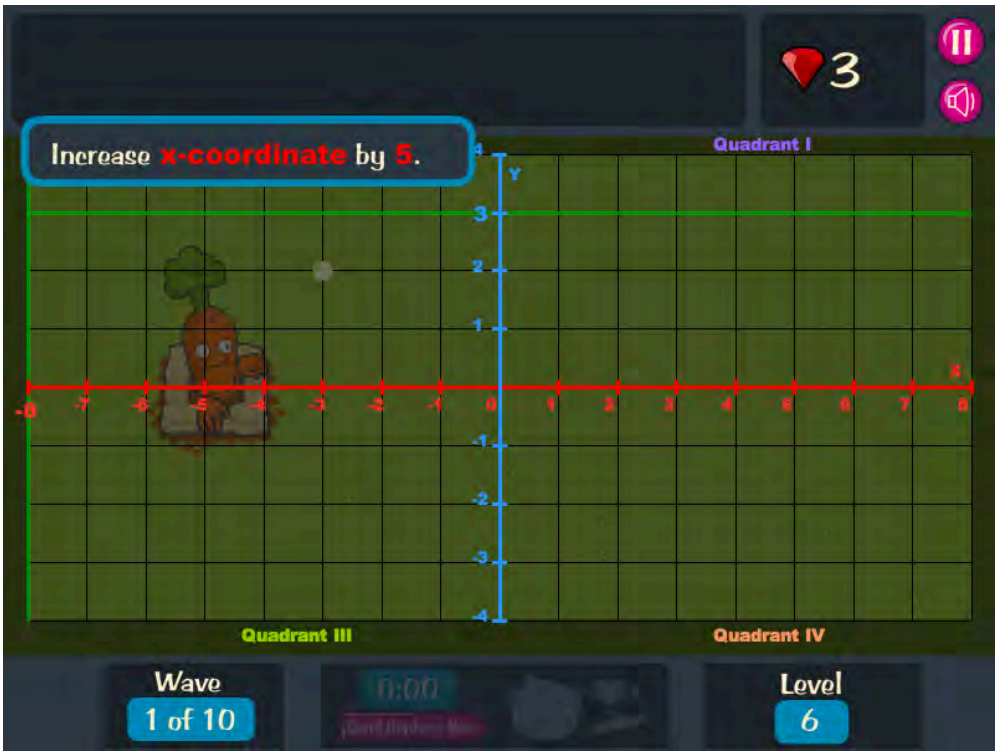


Notice that the gophers on the path appear inside blocks of ice, indicating that they've been temporarily frozen with the Iceberg Lettuce tool:

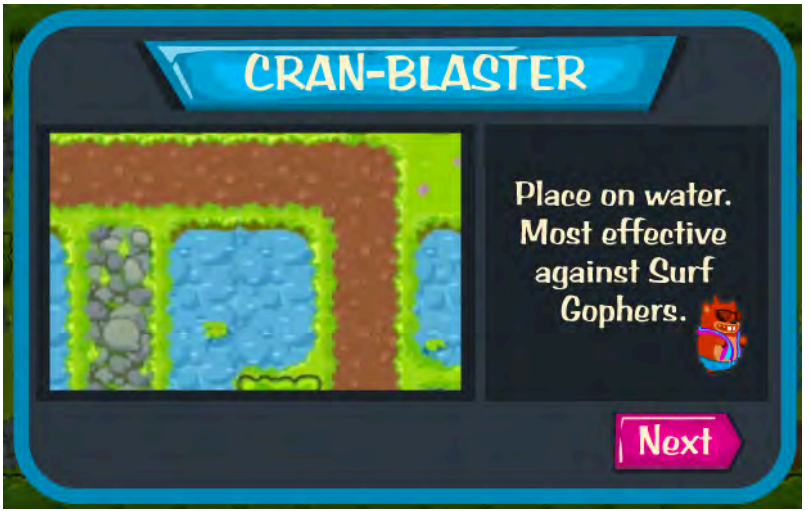


Level 6:

The game gets slightly more complicated in Level 6, in this case asking you to increase or decrease either the x- or y-coordinate by a certain amount:



Your new tool for this level is the Cran-Blaster. Placed on water, it is effective against your new nemesis, Surf Gophers.



Continue with all the 14 levels to reveal the tools, work with more difficult challenges in the coordinate grid, and save your prize carrot!

More information to help you teach with Game Over Gopher:

Teaching with Game Over Gopher (PDF):

http://mathsnacks.com/media/print/GameOverGopher_teachingwith.pdf

Game Over Gopher and the Common Core Standards:

http://mathsnacks.com/gate-en.html - adcommoncore

General Guidelines for Teaching with Math Snacks Games:

http://mathsnacks.com/teaching_edappr.html - games