Aquatic System
Matched 3-20

1

Intro

- During a recent flight over the Amazon Jungle, a new lake was discovered.
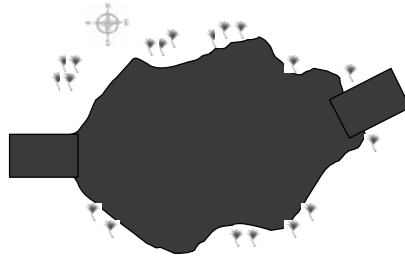- As a biologist, your job is to explore the Lake: Sun Lake.

2

Flash

How to

- You will have a remotely operated vehicle that will can control as you cruise through the lake. This way you can see what is happening underwater.
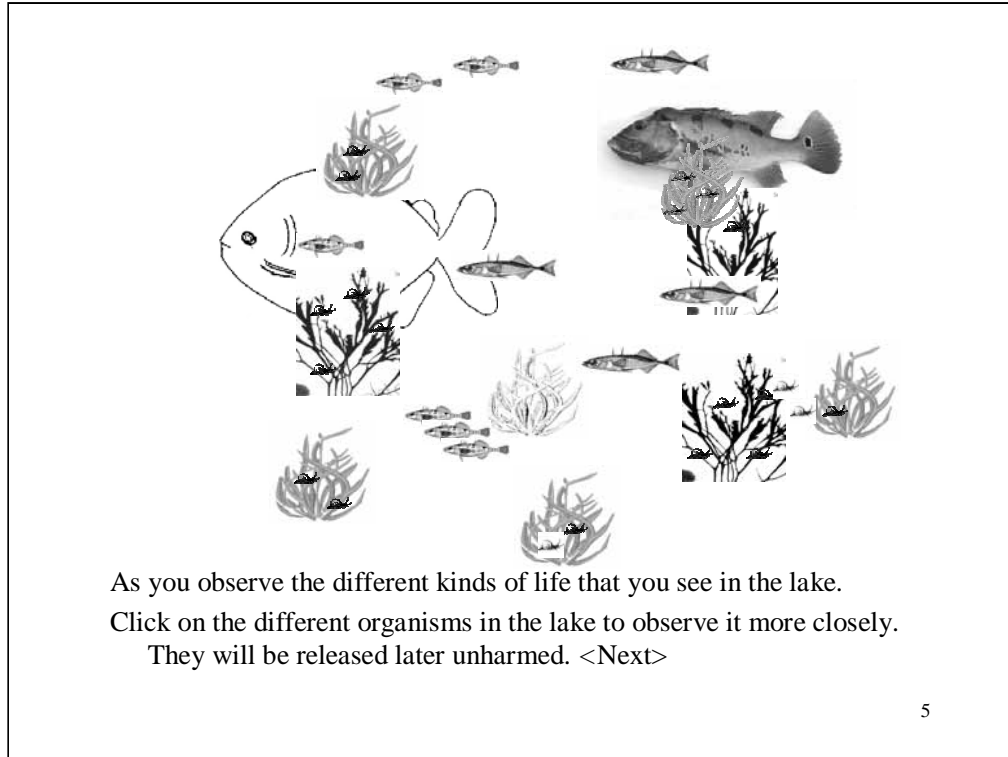
3

FLASH

Students arrive at lake.

- Student observe animation of the ROV being placed into lake.
- Animation finishes with ROV video view of lake.

4

Flash Animation

As you observe the different kinds of life that you see in the lake.

Click on the different organisms in the lake to observe it more closely.
They will be released later unharmed. <Next>

5

Flash Animation

Students click on creatures. When students click on the species in the individual view, then the species is selected and information about the species is provided such mass, cone of vision, name, typical food source, mobility, speed. Time is real time.

ROV does not move but just looks out into the water.

•The organisms in the lake move around eating each other. This represents a small sample of the whole ecosystem that we will see later in Population view. Student will need to observe the organisms and be able to deduce the food chain at this level. It may not be important here to make sure that the organisms are exact proportions—approximations might work here.
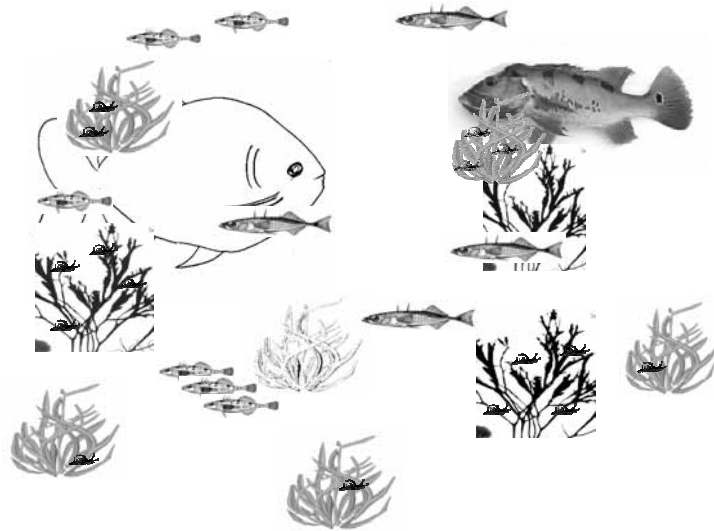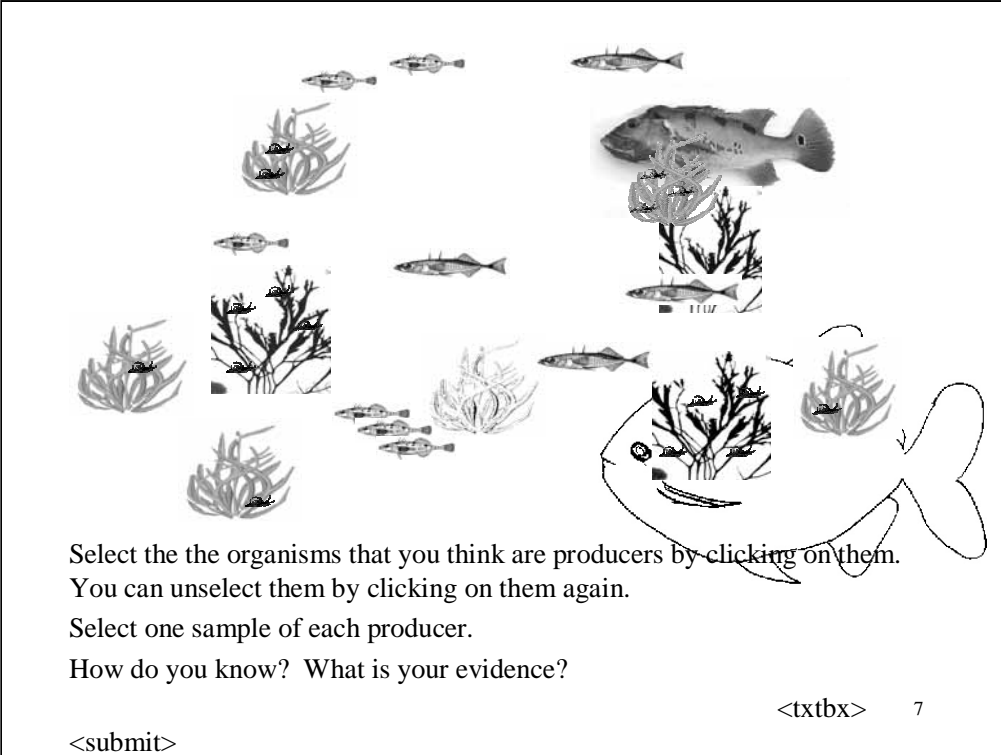
Observe the different kinds of life that you see in the lake.
There seems to be many kinds of organisms in the lake.
How might scientifically classify these organisms? <textbx> <submit>

6

Flash Animation

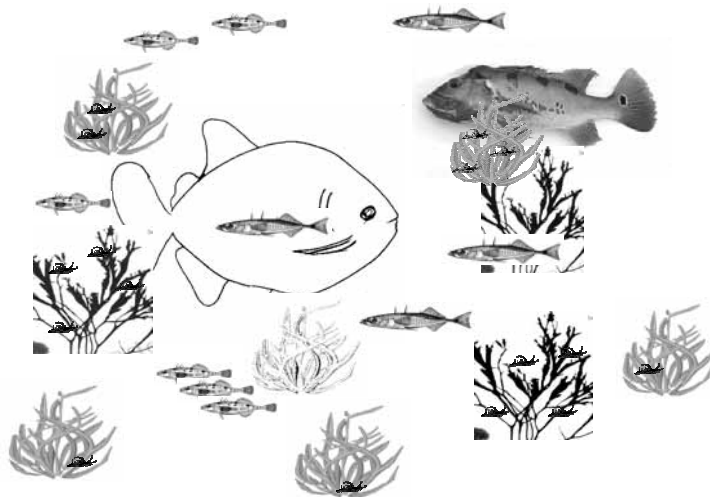Real Time. This one should be coded for a multiple choice item.

Select the the organisms that you think are producers by clicking on them.
You can unselect them by clicking on them again.

Select one sample of each producer.

How do you know? What is your evidence?

<txtbx>   7

<submit>

Flash Animation

Students place organisms into one of two categories.

Select the the organisms that you think are consumer by clicking on them. You can unselect them by clicking on them again.

Select one sample of each consumer.

How do you know? What is your evidence?

<txtbx> <submit>

8

Flash Animation

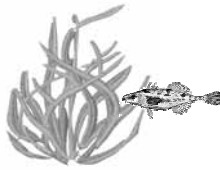Students place organisms into one of two categories.

You observe that the two-spine fish eats snails.

When the fish eats the snail what passes from the snail to the fish? <txtbx> <submit>

Static Picture

This shot represents static pictures of a snail eating secondary consumer.

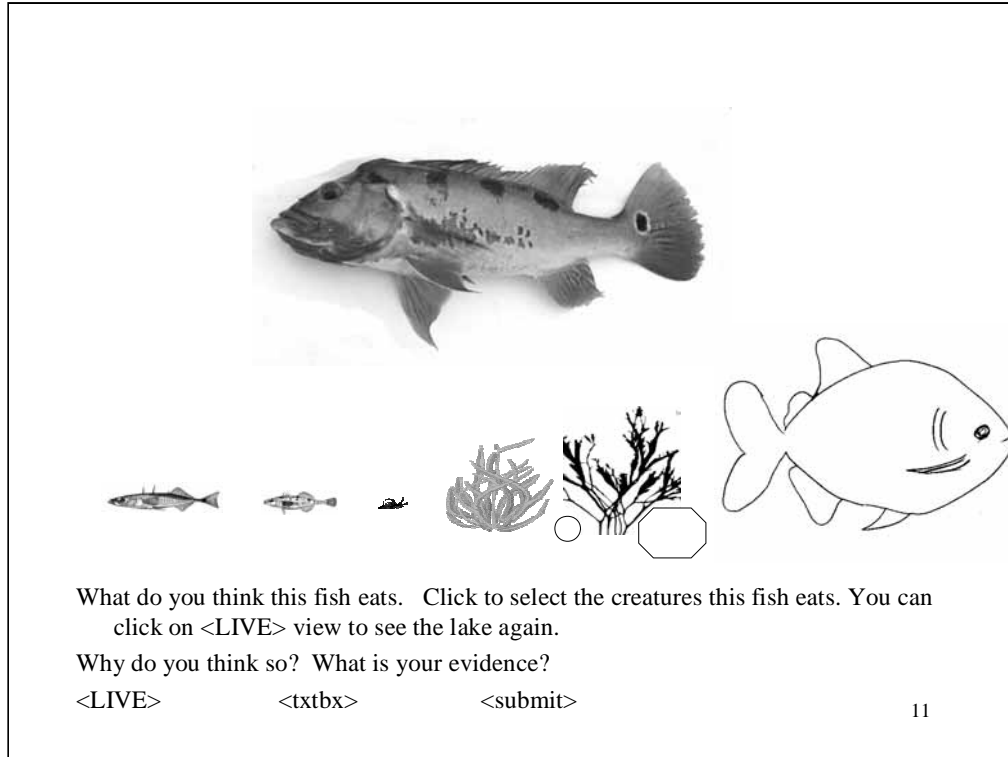You observe that the three spine fish eats the green plants.

When the fish eats the plant what passes from the plant to the fish? <txtbx>
<submit>

10

Static Shot

This shot represents a static shot of the three spine fish eating one plant.

What do you think this fish eats.   Click to select the creatures this fish eats. You can
    click on <LIVE> view to see the lake again.

Why do you think so? What is your evidence?

<LIVE>   <txtbx>   <submit>   11

Static shots of organisms.

Clicking LIVE takes you back to the **Flash Animation**

Students can click on an organism and it is selected.   When students click on
<LIVE> view students see the lake view with animation of the fish swimming
around so that they can make observations of the bass eating the little fishes. A link
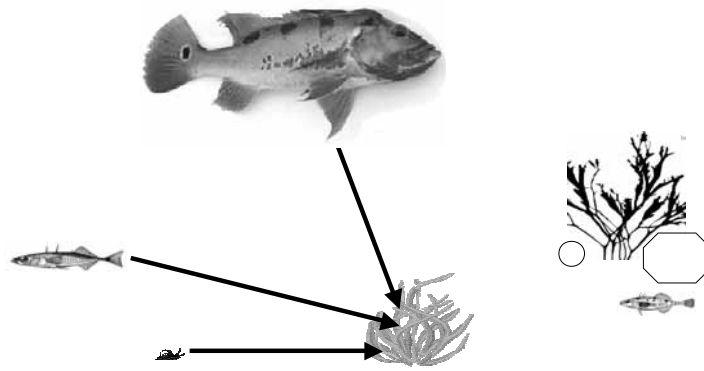from the lake view back to this slide needs to be in place.
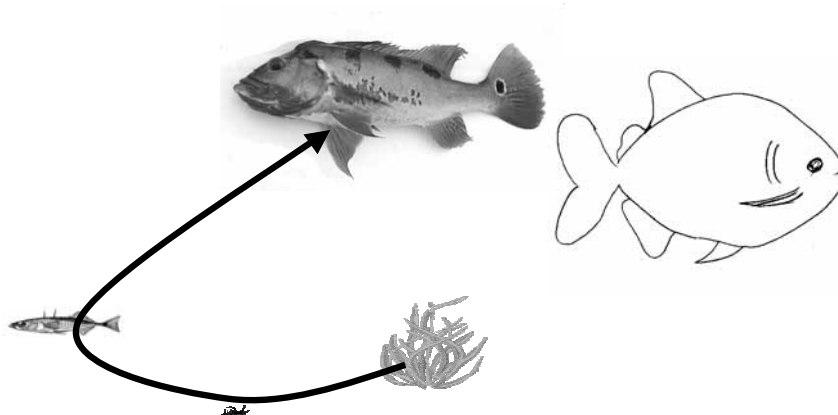
Based on what you know about the lake what might flows along this arrow? Click all that apply.

O Energy O Nitrogen O Oxygen O Carbon Dioxide

12

Static Shot

Based on what you know about ecosystems what might flow along this arrow? Click all that apply.

◉Energy ◉Nitrogen ◉ Oxygen ◉Carbon Dioxide

13

Static Shot

Build a food web by clicking on two species. First the food then the eater. Click on those until you are done. You must include each species in the web.

<Live>

Click on LIVE views to see the pond in action again.

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Students can click on these static pictures. After clicking on two species then a arrow is formed from the first species to the second species. When students click on "LIVE" they see the view from the orv, individual view, real time with the fish swimming around.
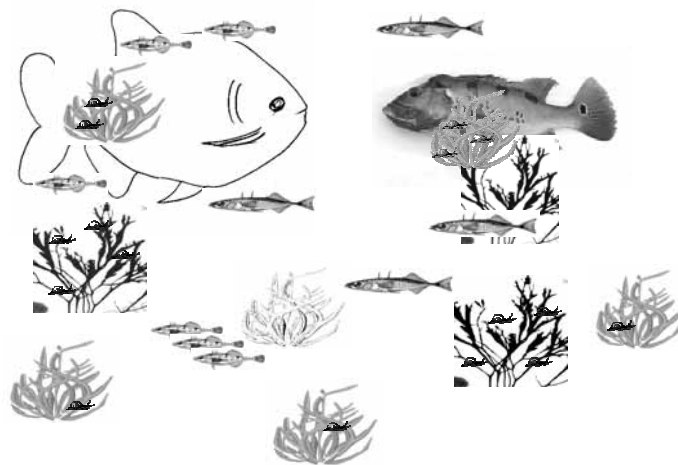
Based on what you have seen, predict what will happen to the population of cichla temensis peacock bass as the population of plants goes down in the short term.

0 stays about the same   0 The pop stays the same and then rises

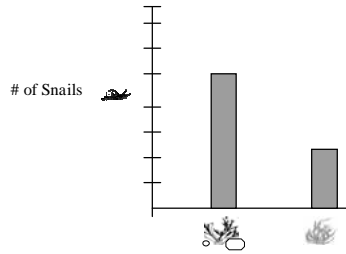0 The population increases   0 The population goes down then increases

Click on run to see what happens.   <run>
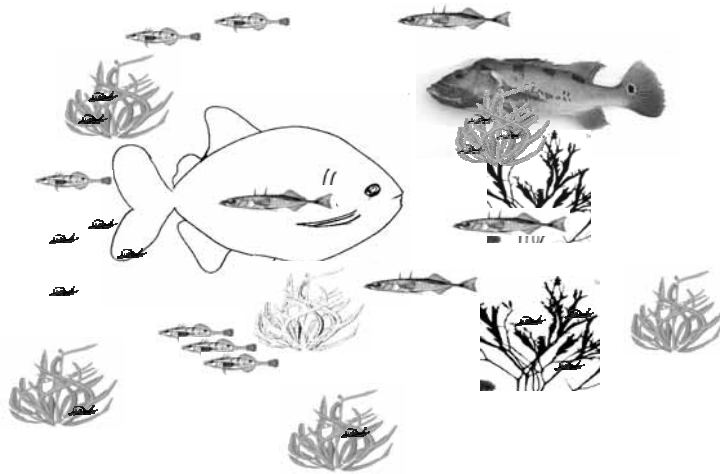
15

Flash Animation/ Linked with Simulation
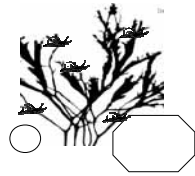
The graph of the right represents the average number of snails you have found on the two types of lake plants. What could explain why there are more snails on the dark plant? <txtbx> <submit>

# of Snails

16

Static View

Some potential responses. *Like it better, easier to hide from predators because it is camouflaged.*

Predict which population of what organism has the greatest effect on the
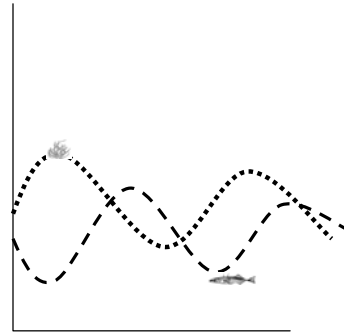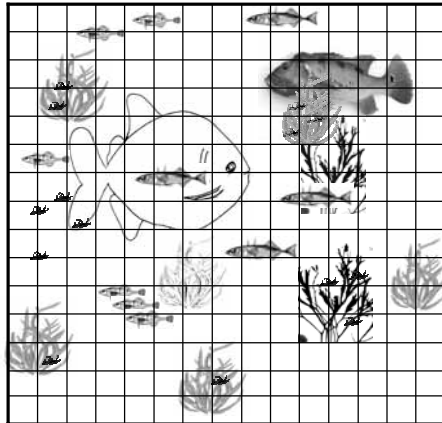
List of organisms here. <TXTBOX>

Why do you think so? <textbox>

17

Flash Animation

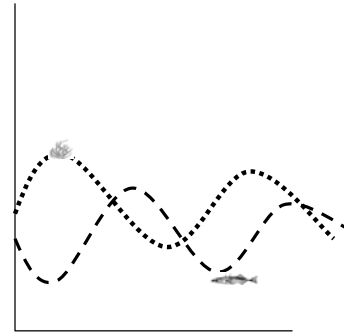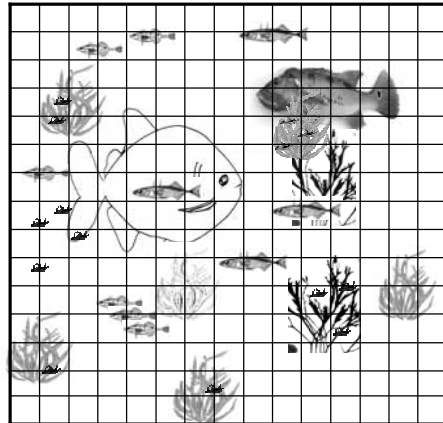Students place organisms into one of two categories. Live well carries forward

To test your prediction, click on the organism that you want to investigate.
Select the starting values of chosen organism. <run>

Did you chose the right organism <TEXTBOX>
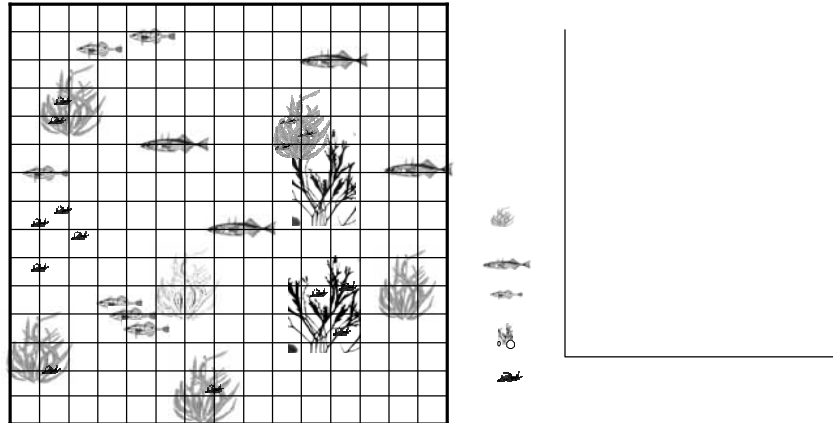
<yes go on>
<no go back and predict again>

Simulation View

Why did you predict would have an effect on

<text box>

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Simulation View

Students' responses will appear in the text. The graph will display the response based on what the student has chosen before.
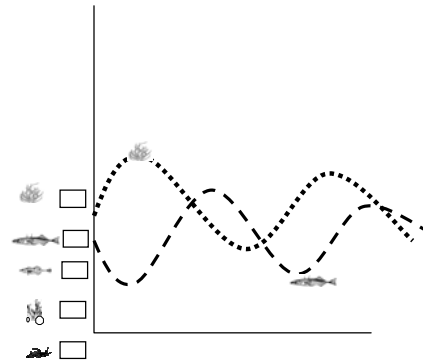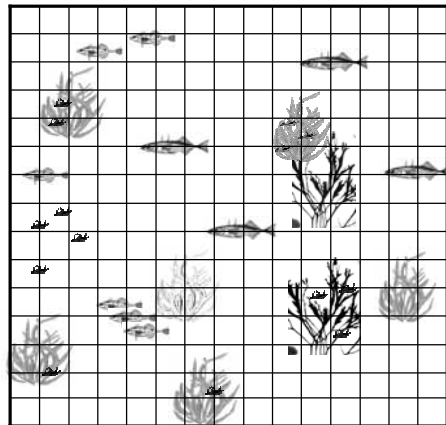
Your new goal is to recreate this lake ecosystem in your live well so that you can study the organisms more carefully and your goal is to make the ecosystem survive without your help for as long as possible. You will be able to place three organisms in your well from those shown above and then you can test your recreated lake system. <NEXT>

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Simulation View

Blank graph.

Select three organisms and add up to 100 of each into the live well. Enter the
   number of organisms in the box next to the organism picture. Click run
   to launch the ecosystem. Adjust the numbers and the organisms until
   you can get a ecosystem to run for XX days. You will get five tries.
   When you are done click submit and next.

<RESET> <RUN> <Submit and NEXT>

Simulation View

Students will be able to submit the number of organisms to test out in their live well. The population view will
show the population view that the student select and the graph will show the number of organisms that the
students select. Once the student hit <RUN> then the ecosystem launches for XX days and then stops with the
final numbers in place.
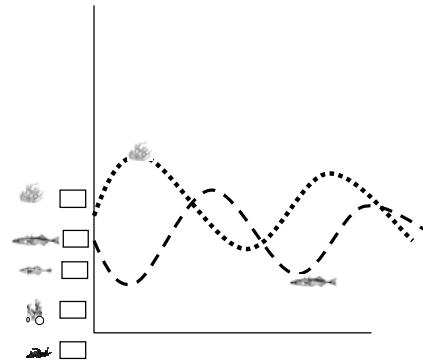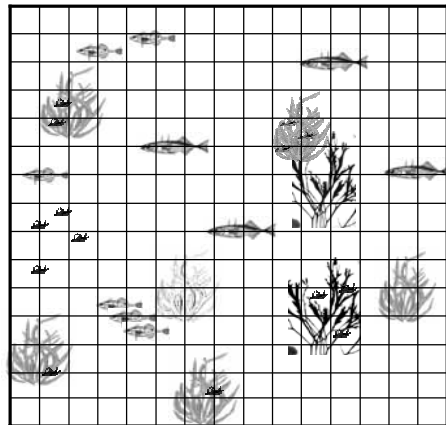
Before you get started. What evidence are you going to collect?
<TEXTBOX>
<RESET> <RUN> <Submit and NEXT>

22

Simulation View

Students will be able to submit the number of organisms to test out in their live well. The population view will show the population view that the student select and the graph will show the number of organisms that the students select. Once the student hit <RUN> then the ecosystem launches for XX days and then stops with the final numbers in place.
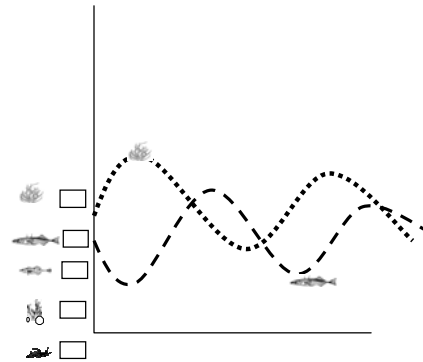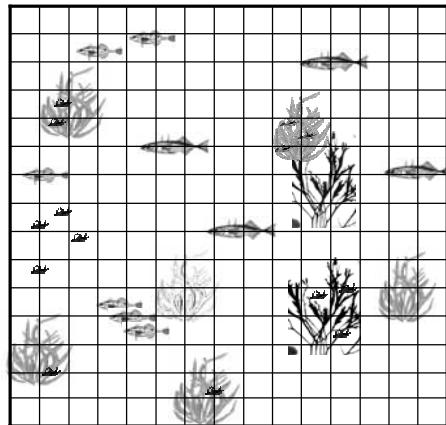
What happened in your ecosystem? <TXTBOX>

What did # of ____ do for your ecosystem? <TXTBOX>

Why did you select # of ____? <TXTBOX>

What might happen if you increased the number of ____ to 3 times the number you selected? Why? <TXTBOX>

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Simulation View

The view is that of the finished run.

The textboxes are large enough for student responses.

Each of the three bottom questions have information about what the student select. Each question focuses on a different species.