Learning Set 1

Back to the Big Challenge

Make recommendations about developing a new rice plant that will produce more rice and more nutritious rice.

RBWI
The Rice for a Better World Institute

To: All Collaborating Scientists

From: The Rice for a Better World Institute (RBWI)

Subject: Rice Traits

The Rice for a Better World Institute (RBWI) has received your information on how rice grains vary in size and on the starch content of different rice varieties. We think you will need to know the certain traits of all the different rices our researchers have developed. We have listed those traits in the chart below.

Rice variety	Trait
A	grows well in dry conditions
B	grows well even in flood conditions
C	has high starch content
D	has high fiber content
E	has high levels of vitamins and minerals
F	is resistant to maggots (pests)
G	is resistant to worms (pests)
H	is resistant to caterpillars (pests)

Rice variety	Trait
I	is resistant to beetles (pests)
J	is resistant to grasshoppers (pests)
K	is resistant to rice blast (disease)
L	is resistant to leaf blight (disease)
M	is resistant to fungus (disease)
N	is resistant to stem rot (disease)
O	produces more rice grains per plant than other rices
P	requires less fertilizer per acre of rice than other rices

The goal of the RBWI and the collaborating scientists is to combine as many of these traits as possible in a new rice plant. As you go forward in your investigation, please keep this goal in mind. With your help, we may be able to produce a new rice plant with the most desirable traits.

Conference

Using what you have learned about rice and the traits of rice plants, discuss with your class the answers to the following questions and how each relates to your criteria and constraints.

- **What kind of traits do you think are most desirable for a new rice plant to have? How will this affect your recommendations?**
- **How will you make sure the traits of the new rice plant will meet the criteria?**
- **How will constraints you learned about affect your recommendations?**
- **What information from this *Learning Set* will you use to help you make your recommendations?**
- **What questions do you still have?**

As you listen to your classmates, make sure you understand the answers to these questions. If you do not understand something, or if they did not present something clearly enough, ask questions. Be careful to ask your questions and make your suggestions respectfully.

Update Criteria and Constraints

Revisit the criteria and constraints for this challenge. Now that you have learned more about how rices are different from each other, you may have found that there is more to think about than you earlier imagined. You may now realize that the criteria and constraints are different than you had first expected. For example, you know that the amount of starch in a seed is important in developing a more nutritious rice. You read information from the Research Institute and now know that developing a rice resistant to pests and diseases is also an important thing to think about. Using your new knowledge, update your list of criteria and constraints, making it more accurate. A more accurate list will help you better achieve the challenge.

Update the *Project Board*

What you've learned about different traits in rice has probably given you a better idea of what you need to do to address the challenge. That new learning has allowed you to identify additional questions you need to answer. You might also have ideas for investigations you would like to conduct. You've updated the criteria and constraints for the challenge. Now it is time to add your new questions and ideas for investigations to the *Project Board*. Add your questions and ideas to the *What do we need to investigate?* column. You probably identified traits you want your new rice to have. Put your recommendations about traits the rice should have in the last column of the *Project Board*. Feel free to add to the *What have we learned?* or *What is our evidence?* or *What do we think we know?* columns if you discover things that you did not put into those columns earlier. As the class *Project Board* is updated, remember to update your personal *Project Board*.