

Elementary School



DESIGN PACKET

Educational Product

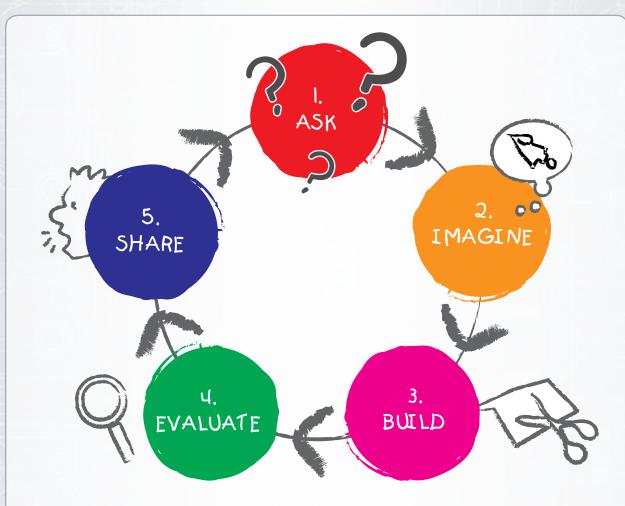
Educators & Students | Grades K-5

NP-2009-12-228-LaRC

NASA Our World (Grades K-5)

www.nasa.gov/education/nasaeclips







Steps of the Design Process

1. ASK

- · What is the problem?
- · What have others done?
- · What are the limits?

2. IMAGINE

- · What are some solutions?
- · Brainstorm ideas.
- · Choose the best one.

3. BUILD

- · Draw a diagram.
- · Make lists of materials you will need.
- · Follow your plan and build it.

4. EVALUATE

- · Test it out!
- · Record your results.
- · Make changes to improve it.

5. SHARE

· Explain your ideas to others.

Step I: Ask

A. What is the problem?

B. What have others done to solve this problem?

C. What are the limits? These may include such things as cost or time.

Step 2: Imagine



A. What are some solutions? Brainstorm ideas and list them.

B.Choose the best idea and explain why you think it is the best.

C. Brainstorm ideas for each part of the design chosen by your team. Be sure everyone can explain the choices.

Step 3

Step 3: Build



A. Draw a diagram of your design.
On the drawing, label all parts clearly.

B. Make a list of the materials you will need.

Describe why you have chosen these materials.

C. Follow your plan and build the model.

D. How did your drawing help you build your model? How would your drawings and notes help others?

E. If there are any differences between your drawing and your model, explain why you made these changes.

Step 4: Evaluate



A. Test your model. Describe the test you used.

B. Record your results.

C. Did your model do what was expected? Describe what you observed.

D. Did the materials you use work? What other materials might be better?

E. What changes would you make to improve your model? Why would you make each change? Are there any reasons you cannot make the changes you would like to make?

F. Make changes to improve your model. Go back and mark any changes you made on your original drawing.

Step 5

Step 5: Share



- A. Explain your ideas to others. You might:
 - make a poster. give a speech. make a short video.
 - make a video collage. write a letter to NASA convincing them to build your model.

Be sure to include sketches, pictures, data and graphs in your presentation.

B. Tell what each member of the team did for this project.

EXTEND (Optional):

A. Compare your design to others. How are the designs different? Is there some part of another design you would like to add to your design?

B. How could you test which model is best?

Decide on a test and try it out.

Design Challenge Evaluation Rubric

Elementary School Design Packet

Group Members:					

Rubric Category	Score
Ask	
The problem is clearly explained.	
The work others have done to solve the problem	is listed.
At least two limits are listed and explained.	
Imagine	
Two or three ideas for solutions are listed.	
• One idea is chosen by the team and reasons for	the choice are included.
Each part of the design can be explained and de	fended by the team.
Build	
• A diagram of the model is made before the mode	el is built.
• The model is built based on the original design.	
Reasons for design changes are given.	
The materials list includes everything that will be	needed to build the model.
Reasons for material choices are given.	
Evaluate	
All questions in the student handout are complete	ed.
Answers are correct and make sense.	
The model is tested.	
Results of the test are recorded neatly and accur	rately.
Share	
The presentation is well-organized.	
• Presentation includes sketches, pictures, data or	graphs.
The work on the project is shared equally by mer	mbers of the team.
Each member of the team contributes ideas and	suggestions.
	TOTAL (out of 20 pts possible)

- 4 (Excellent) = All directions (questions, steps and details) are met or followed.
- 3 (Good) = Most directions are met with only a few mistakes.
- 2 (Fair) = Many directions are not met and/or there are many mistakes.
- 1 (Poor) = Most directions are not met and there is missing information.
- 0 (No effort) = No effort to meet directions.