



# MISSION IMAGINATION

inspire. explore. engage.

Design Notebook



INTERNATIONAL  
**SPACE  
STATION**

OFF THE EARTH, FOR THE EARTH

*...and in the classroom!*



TEXAS  
INSTRUMENTS

# Challenge #1

## Step 1: Identify the Problem

- Restate the challenge in your own words.

## Step 2: Identify Criteria and Constraints

- Identify any conditions that must be met to solve the problem, along with anything that might limit a solution such as cost, availability of materials, safety, etc.

### **Step 3: Brainstorm Possible Solutions**

- Research what others have done to try to solve this problem.
- Generate new ideas for solutions.

### **Step 4: Select a Plan/Model**

- Choose two or three of the best ideas, and make a plan or model of each.
- Select one plan/model to move forward. Justify your choice.

## **Step 5: Design a Plan/Build a Model**

- Design a detailed plan of your solution. Include a list of materials and detailed procedures (if necessary). If you build or sketch a model, be sure to show it in your video, or you can include a link to it here.

## **Step 6: Evaluate the Plan/Test the Model**

- List the strengths and weaknesses of your solution.
- Due to constraints, discuss what changes or compromises had to be made (if any). Determine if your solution answers the challenge.

## **Step 7: Refine the Plan/Model**

- Based on the results of your evaluation, identify any improvements to your solution.

## **Step 8: Share the Solution**

- Organize your findings and submit your final solution. Remember, you or your adult sponsor can upload your design notebook at any time to keep track of your progress. Also, don't forget to start thinking about your short video!



# Challenge #2

## Step 1: Identify the Problem

- Restate the challenge in your own words.

## Step 2: Identify Criteria and Constraints

- Identify any conditions that must be met to solve the problem, along with anything that might limit a solution such as cost, availability of materials, safety, etc.

### **Step 3: Brainstorm Possible Solutions**

- Research what others have done to try to solve this problem.
- Generate new ideas for solutions.

### **Step 4: Select a Plan/Model**

- Choose two or three of the best ideas, and make a plan or model of each.
- Select one plan/model to move forward. Justify your choice.



## **Step 5: Design a Plan/Build a Model**

- Design a detailed plan of your solution. Include a list of materials and detailed procedures (if necessary). If you build or sketch a model, be sure to show it in your video, or you can include a link to it here.

## **Step 6: Evaluate the Plan/Test the Model**

- List the strengths and weaknesses of your solution.
- Due to constraints, discuss what changes or compromises had to be made (if any). Determine if your solution answers the challenge.

## **Step 7: Refine the Plan/Model**

- Based on the results of your evaluation, identify any improvements to your solution.

## **Step 8: Share the Solution**

- Organize your findings and submit your final solution. Remember, you or your adult sponsor can upload your design notebook at any time to keep track of your progress. Also, don't forget to start thinking about your short video!

# Challenge #3

## Step 1: Identify the Problem

- Restate the challenge in your own words.

## Step 2: Identify Criteria and Constraints

- Identify any conditions that must be met to solve the problem, along with anything that might limit a solution such as cost, availability of materials, safety, etc.

### **Step 3: Brainstorm Possible Solutions**

- Research what others have done to try to solve this problem.
- Generate new ideas for solutions.

### **Step 4: Select a Plan/Model**

- Choose two or three of the best ideas, and make a plan or model of each.
- Select one plan/model to move forward. Justify your choice.

## **Step 5: Design a Plan/Build a Model**

- Design a detailed plan of your solution. Include a list of materials and detailed procedures (if necessary). If you build or sketch a model, be sure to show it in your video, or you can include a link to it here.



## **Step 6: Evaluate the Plan/Test the Model**

- List the strengths and weaknesses of your solution.
- Due to constraints, discuss what changes or compromises had to be made (if any). Determine if your solution answers the challenge.

## **Step 7: Refine the Plan/Model**

- Based on the results of your evaluation, identify any improvements to your solution.

## **Step 8: Share the Solution**

- Organize your findings and submit your final solution. Remember, you or your adult sponsor can upload your design notebook at any time to keep track of your progress. Also, don't forget to start thinking about your short video!

# Challenge #4

## Step 1: Identify the Problem

- Restate the challenge in your own words.

## Step 2: Identify Criteria and Constraints

- Identify any conditions that must be met to solve the problem, along with anything that might limit a solution such as cost, availability of materials, safety, etc.

### **Step 3: Brainstorm Possible Solutions**

- Research what others have done to try to solve this problem.
- Generate new ideas for solutions.

### **Step 4: Select a Plan/Model**

- Choose two or three of the best ideas, and make a plan or model of each.
- Select one plan/model to move forward. Justify your choice.

## **Step 5: Design a Plan/Build a Model**

- Design a detailed plan of your solution. Include a list of materials and detailed procedures (if necessary). If you build or sketch a model, be sure to show it in your video, or you can include a link to it here.

## Step 6: Evaluate the Plan/Test the Model

- List the strengths and weaknesses of your solution.
- Due to constraints, discuss what changes or compromises had to be made (if any). Determine if your solution answers the challenge.



## **Step 7: Refine the Plan/Model**

- Based on the results of your evaluation, identify any improvements to your solution.

## **Step 8: Share the Solution**

- Organize your findings and submit your final solution. Remember, you or your adult sponsor can upload your design notebook at any time to keep track of your progress. Also, don't forget your short video!

# Video Submission

Provide the link to your video submission (must use <https://vimeo.com>). Be sure to include the password if your video is private.

Video link:

Password for viewing (if needed):