“Innovation for the Next Generation”
Science Research Project

Background:
Science is at work in the world all around us, not just in our classroom. Scientific concepts can be used to help solve real problems that people face everyday all around the globe. For example, science is currently at work saving our coastlines, combating climate change, exploring outer space and the oceans, creating medicines, and developing new technologies to make our lives better.

For this science project, you will use teamwork, creativity, and critical thinking. Each of you will be assigned to a partnership or a group for this project. Each team will choose a technology or innovation that is currently being used today and explore what the technology does and how it came about. After that, your team will imagine how the current technology could be transformed and improved for the future to help benefit people’s lives.

**Step 1: Identify Existing Technologies**

1. Look at the books, magazines, and websites in the library. Find examples of current technologies or innovations that exist today that have made a positive difference by improving the world we live in. 

Record your three examples below:

<table>
<thead>
<tr>
<th>Current Technology or Innovation:</th>
<th>What does it do?</th>
<th>How does this benefit the world?</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
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</table>
**Step 1: Identify Existing Technologies - continued**

2. Share your examples with a table partner.

3. Which of these technologies or innovations do you think have the greatest potential to be adapted in the future to improve the world for the next generation?

   **Pick Your Favorite Five. List One in Each Lightbulb:**

   ![Lightbulbs](image)

4. Share your five favorite “lightbulb ideas” with the rest of your table. As a table group, talk about the ideas and **brainstorm** others that you think have potential for future innovations. List as many ideas as possible below. At this point, all ideas are good ideas! The more ideas, the better.
Step 2: Get to Know Your Topic

<table>
<thead>
<tr>
<th>Team Members:</th>
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<tbody>
<tr>
<td>Current Technology or Innovation Topic:</td>
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</table>

1. What do you already KNOW about your topic?

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2. What do you WONDER about your topic?

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3. What research questions do you have?

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Step 3: Research Your Topic- Finding information

In this next step, you and your teammates will use reference resource materials to learn as much as you can about your current technology topic.

At a minimum, you must be able to explain:

1. What your technology/innovation is and who uses it
2. How it works -- what science is involved
3. Why it helps the world
4. Who is credited with inventing/creating it
5. How it has changed over time

Look for information in a variety of reference resources:

<table>
<thead>
<tr>
<th>Type of Reference Material</th>
<th>Recommended Sources</th>
</tr>
</thead>
</table>
| Online Encyclopedias       | Linked from LS Library Web Page--  
|                            | Username- waeagle, Password- waeagle  
|                            | b. World Book Online: [www.worldbookonline.com](http://www.worldbookonline.com)  
|                            | Username- waeagle, Password- waeagle |
| Non-Fiction Books          | a. In School Access- All Books on Library Reserve Cart  
|                            | b. Online Access- eBooks via Follett Shelf  
|                            | Log-In: firstname.lastname Password: student id# |
| Magazines                  | a. Print copies are on the Library Reserve Cart  
|                            | b. Database and website links are provided via LS Library LibGuide at: [http://woodward.libguides.com/innovation](http://woodward.libguides.com/innovation) |
| Web Sites                  | a. Selected links are provided via LS Library LibGuide at: [http://woodward.libguides.com/innovation](http://woodward.libguides.com/innovation)  
|                            | b. Be selective!  
|                            | Use “Web Site Evaluation Criteria” when choosing a site to use as a source |
Step 3: Research Your Topic - Citing Sources

Record your reference resources **before taking any notes**

1. One team member should create a Google Doc in your Science Folder and share it with other team members.
2. As you take notes from a source, record the source’s publication information on the Note Organizer and in the Google Doc.
3. Your team will turn in a Bibliography at the end of the project.

Citation Examples:

1. For Online Encyclopedia Articles:
   - **Encyclopedia Britannica**: copy/paste citation from under checkmark
   - **World Book Student**: copy/paste the MLA MLA citation from bottom of page

2. For Books: look at the Title Page and Copyright Page

   Example: Author’s Last Name, First Name. *Title of Book (in italics)*. Publishing Company Name, Copyright Date.


3. Web Sites

   Example:
### Step 3: Research Your Topic - Taking Notes

Remember when taking notes to:

- Be brief - use fact fragments instead of writing in complete sentences.
- Paraphrase the information - summarize info in your own words.
- Be accurate - check your facts.
- Record all of your reference sources

<table>
<thead>
<tr>
<th>This source is a:</th>
<th>Encyclopedia</th>
<th></th>
<th>Website</th>
<th></th>
<th>Book</th>
<th></th>
<th>Other</th>
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</table>

**Webpage/Article/Book Title:**

____________________________________________

**Author:**

____________________________________________

**Date of Publication or Copyright:** ____________

**Date of Access:** _________________________

**Name of the Website:**

____________________________________________

**Publisher:**

______________________________

**URL:**

____________________________________________

**Page Numbers:** ______________________________

**Notes from this source:**

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Step 4: Envisioning the Future

A. Brainstorm Future Technology Ideas

Think outside the box! Brainstorm as many ideas of what your present technology will look like in 20 years as you can come up with. Jot down your ideas in the thought bubble below:
## Step 5: Ideate-- Develop Your Innovation

Our Future Technology is called a: ____________________________________________

1. Describe your future technology? What is it and what does it do? Who uses it?

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2. Explain how it works.
What science or technology is involved in the way it works?

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3. What problem does your future innovation solve that the technology does not solve now? In other words how will it make a positive difference in the world?

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Step 6: Ideate-- Develop your Innovation Idea

Prototype and Testing

A. Create a prototype of your future technology.

Draw a sketch of what your future technology would look like below. Create multiple views. Use another sheet of paper if necessary. After creating the rough draft below, you will create a final prototype. The final prototype may be a drawing or a physical model.
### Step 6: Prototype and Testing- continued

**B.**

**Develop a Plan to Test Your Idea:**

<table>
<thead>
<tr>
<th>Description of Test:</th>
<th>Notes from Actual Test:</th>
</tr>
</thead>
</table>

<table>
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<tr>
<th>Steps to Be Followed:</th>
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<table>
<thead>
<tr>
<th>Type of data to be collected:</th>
<th>Data record:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Interview Questions to be Asked:</th>
<th>Responses to Questions:</th>
</tr>
</thead>
</table>
Step 6: Prototype Test Results

A. Test Results:

<table>
<thead>
<tr>
<th>What worked?</th>
<th>What did not work?</th>
</tr>
</thead>
</table>

B. Summarize your test results by finishing the statements below:

- We met with...
- We were amazed to discover...
- We wonder if this means...
- It would be game changing if we...
C. Consequences-

All technologies have positive and negative impacts on society. Think about how your idea will work. What are some of the consequences associated with your design? Consider both the good things that will happen as a result of your innovation and the not so good, or bad things that might occur.

List the positives and negatives of your innovation below:

<table>
<thead>
<tr>
<th>At Least Two:</th>
<th>At Least Two:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positives:</strong></td>
<td><strong>Negatives:</strong></td>
</tr>
<tr>
<td>1.</td>
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<td>2.</td>
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<td>3.</td>
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Step 7: Reiterate- Rethink your Design

Are there any changes to your design that you would make based on the tests?

Step 8: Share Your New Knowledge

A. Write an Abstract

You and your team will write one Abstract that summarizes your future innovation in no more than 150 words.

Be sure to:
1. Double Space
2. Use size 12 Times New Roman
3. Add your proper heading with all team member names
4. Add title-- Name of Innovation -- to center of page after heading

The summary should include:
1. why you came up with your idea
2. a brief description of what your Innovation is and what it does
3. why you think it is going to help the world

B. Create a Bibliography

1. Open your shared Google Doc
2. Enter all reference resources from your team’s Note Organizers

Be sure to:
1. Double Space
2. Use size 12 Times New Roman
3. Add the proper heading
4. Add title-- Bibliography-- to center of page after heading
5. Alphabetize the entries
Goal-Setting and Progress Monitoring

Date ____________
Write down your personal goal for the day. Use a complete sentence.

_____________________________________________________________________________________________________________
_____________________________________________________________________________________________________________

How did it go today?  Circle one:

Write down at least one accomplishment that your group achieved during class today. Use complete sentences.

1.____________________________________________________________________________________________________________
_____________________________________________________________________________________________________________

2.____________________________________________________________________________________________________________
_____________________________________________________________________________________________________________

3.____________________________________________________________________________________________________________
_____________________________________________________________________________________________________________

What does your group need help with? This must be in a complete sentence.
____________________________________________________________________________________________________________
_____________________________________________________________________________________________________________

What do you need to work on next? This must be in a complete sentence.
____________________________________________________________________________________________________________
_____________________________________________________________________________________________________________
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___________________________________________________________________________________________________________

What do you need to work on next? This must be in a complete sentence.

___________________________________________________________________________________________________________

___________________________________________________________________________________________________________
Innovation Project: **Self-Assessment**

1. I feel like I have worked as a collaborative (cooperated willingly) team member.

   ![Emoji: Happy] ![Emoji: Sad]  
   Write a one sentence comment:

   ____________________________________________________________

2. I contributed to the project as an innovative/creative thinker.

   ![Emoji: Happy] ![Emoji: Sad]  
   Write a one sentence comment:

   ____________________________________________________________

3. I was a positive team member and helped contribute to the project.

   ![Emoji: Happy] ![Emoji: Sad]  
   Write a one sentence comment:

   ____________________________________________________________

4. I stayed on task.

   ![Emoji: Happy] ![Emoji: Sad]  
   Write a one sentence comment:

   ____________________________________________________________

5. I liked or did not like this project.

   ![Emoji: Happy] ![Emoji: Sad]  
   Write a one sentence comment:

   ____________________________________________________________

   What do you think you could do differently to be a better team member?

   ____________________________________________________________

   ____________________________________________________________

   ____________________________________________________________