

Technology Education

Earle B. Wood Middle School
Rockville, Maryland
Design-Folio

Name:	
Grade:	7th Grade
Date Started:	
Date Due:	
Teacher:	Mr. Bush



Maglev Vehicles Technology Challenge



To design and build a maglev vehicle that is aerodynamic, light in weight and will travel the length of an 8 foot track.

Hints: What is the design brief asking me to do?
What do I need to find out?

What my project must do?

Write a list of the things that your idea must do to solve the challenge



Design Criteria and Constraints List

1	The student must design a maglev vehicle that is aerodynamic and light in weight.
2	*The student must complete pages 1-7 of the design-folio showing all work.
3	The student must construct a maglev vehicle that will travel the length of an 8 feet track.
4	The student must construct a maglev vehicle that will adhere to the following dimensions parameters: Length 3 1/2" to 6", Width 2 1/2", Height 2 - 4"
5	The maglev vehicle must fit into the track.
6	The maglev vehicle must have 4 – 8 magnets.
7	The maglev vehicle must operate without being touched or pushed.
8	Students must work in pairs.

*** Requires Teacher Initials Before Advancing**

Time Frame: Agenda

- 1 Period- Introduction to the Maglev Project.
- 1 Period- Class Discovery & Discussion on Maglev vehicles.
Inspiration Activity #1
- 1 Period- Research and Gather Information from Education Websites.
Inspiration Activity #2
- 5 Periods- Construction of Maglev Vehicle.
- 2 Periods- Testing and Evaluation of Maglev Train.
- 1 Period- Summative Assessment

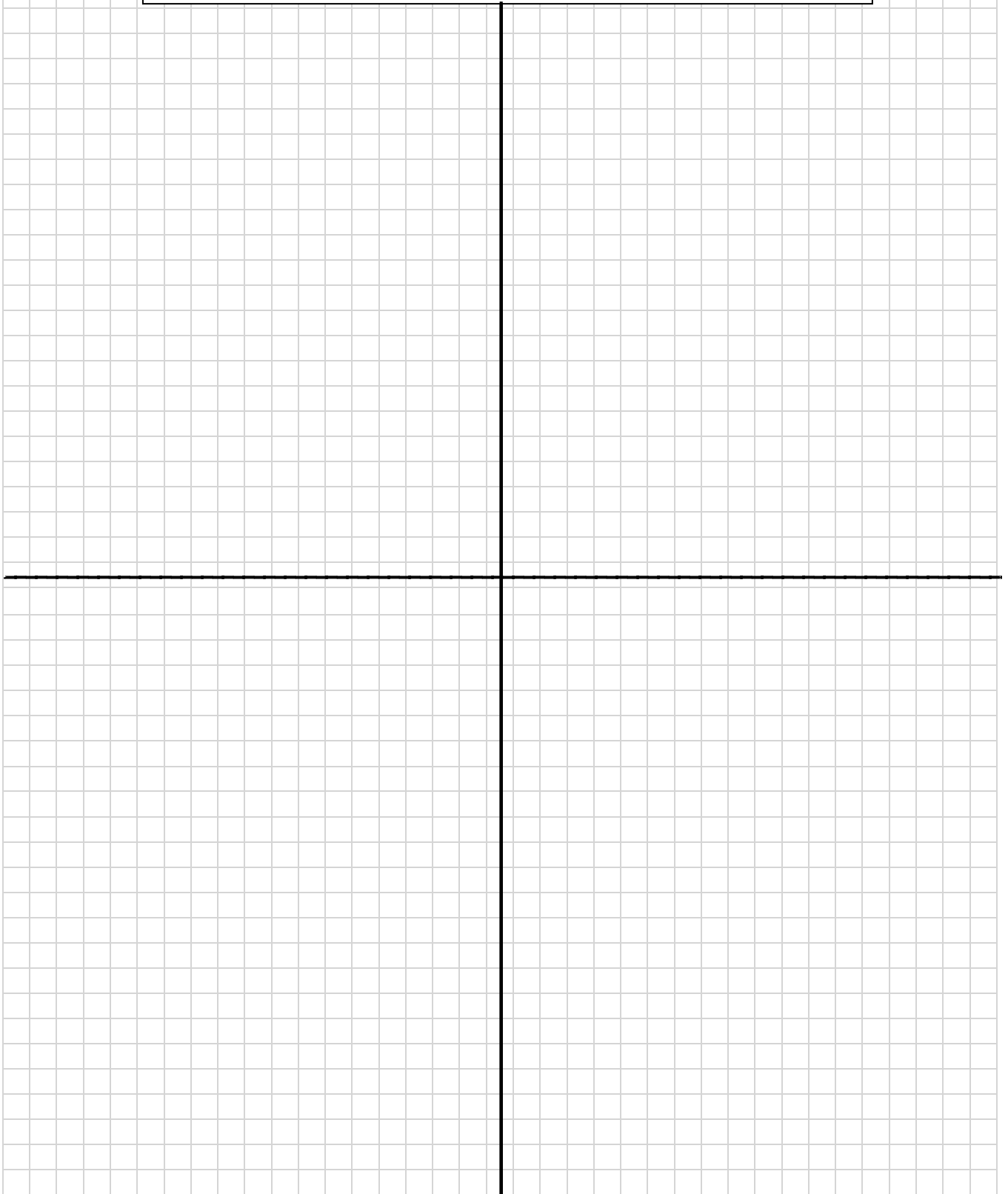
BACKGROUND

During the 20th century, planes, trains, and automobiles revolutionized the way people traveled from place to place. Now in the 21st century scientist and engineers are looking into more energy efficient methods of transportation that will help to reduce the amount of pollution that is created. Heike Onnes, a Dutch physicist, first discovered superconductivity in 1911. Superconductors are designed to allow electricity to flow without any resistance. This is very important in the design and construction of Maglev Trains. Maglev trains will be able to reach speeds of 300 mph, transport a large number of people, and travel without carrying any fuel on-board.

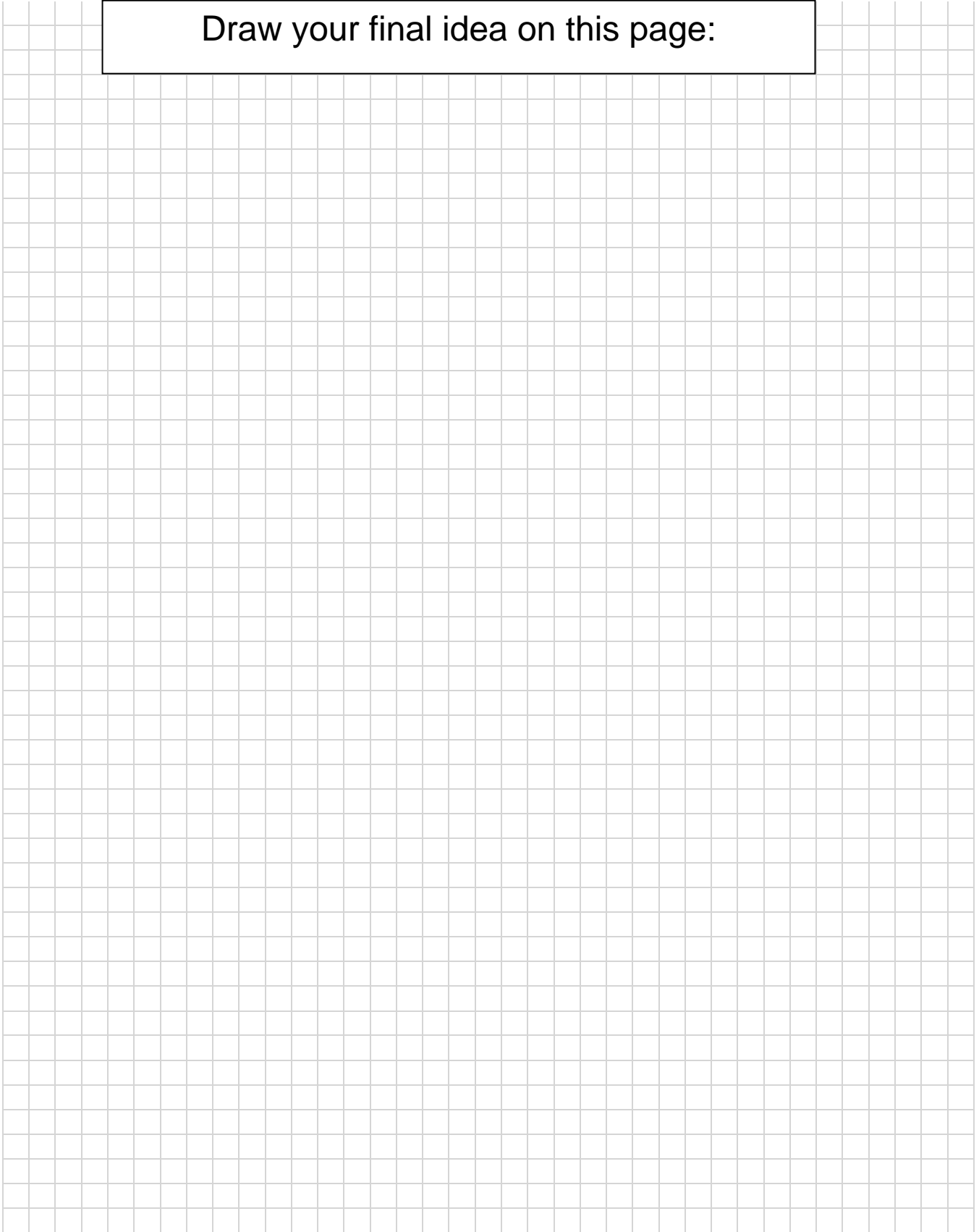
EDUCATIONAL RESOURCES

- <http://inventors.about.com/library/inventors/blrailroad.htm>
- <http://www.ecsel.psu.edu/~dbieryla/maglev/index.html>
- <http://www.o-keating.com/hsr/maglev.htm>
- <http://www.beaconschool.org/~ppicard/highspeed.html>
- <http://www.uh.edu/engines/epi1745.htm>

Draw pictures or diagrams of your ideas:



Draw your final idea on this page:



Tools, Machines, and Processes Safety Sheet

List the tool or machine and the necessary steps to operate them safe and efficiently

Write the proper name of the machine or tool on this line

List below the important information that is needed to remember when using the machine or tool.

Draw a sketch of the machine or tool in this box.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____

Final Question

Have I used this device before? Yes No (circle one)

If yes, then briefly describe _____

Give reasons for the choice of your final design

The design chosen is the most suitable because...



Information: _____
Energy: _____
People: _____
Capital: _____
Time: _____

Tools and Machines:

Materials:

Processes:



What things was I really happy with when the design was made...



What things were OK when the design was made...



What things I was not happy with when the design was made.....

How I could improve my design?

What I learned while working on this challenge

MASTERY OBJECTIVES

- Students will apply the knowledge of how technological systems function to solve problems. (TELO #1.3)
- Students will research the historic, present, and futuristic impacts of technology on society. (TELO #2.6)
- Students will experience the intellectual processes of a technologist by: analyzing, visualizing, computing, constructing, designing, modeling, etc. (TELO #3.6)

TECHNOLOGICAL SYSTEMS

- Transportation
- Power & Energy
- Construction
- Communication

PRINCIPLES & CONTEXT

- ◆ **Maglev Trains-** A train that floats on a magnetic field above a track instead of rolling on wheels; short for magnetic levitation.
- ◆ **Friction-** Causes a loss of energy, generates heat and mechanical wear on the parts of a system.
- ◆ **Aerodynamics-** The branch of science having to do with forces created by air; streamlined
- ◆ **Magnet-** A material that attracts iron and certain other materials by virtue of a surrounding field of electrons; magnets have two poles, north and south. Unlike poles attract (North and South) like poles repel (South and South).