

**Overview**

Alone, or in a group of at most two, your task is to create a science demonstration resource that can be used by a teacher in a lower grade. You can capture the demo in a video or create a written resource for a computer simulation. Either way you need to write background information and leading questions for a teacher to use with their class. This project has a value of 25% of your overall grade.

**Topics**

- Grade 3
  - Invisible Forces (magnets, electrostatic)
  - Materials & Structures (building/breaking structures and their shapes)
- Grade 4
  - Sound (breaking a glass with resonance)
- Grade 5
  - Forces (gravity, friction, circular)
  - Simple Machines (levers)
  - Chemistry (chemical reactions)
- Grade 6
  - Static Electricity (simulated lightning with shock generator, transfer of charges)
  - Electricity & Magnetism (current through a wire)
  - Flight (lift off without moving, Bernoulli's principle, thrust)
  - Space (water rocket, chemical rocket)
- Grade 7
  - Heat (boil water add coloured chalk, simulations, boil oil and water)
- Grade 8
  - Fluids (oil dropped in to water, helium balloon in car, simulations)
  - Optics (refraction-materials and simulation)

**Project Breakdown**

1. Choose a concept and target audience for your demonstration.
2. Plan and execute your demonstration which changes at least one variable (materials needed, etc., video editing).
3. Create the teacher guide and student information/worksheets.
4. Assemble all documents.

**Evaluation Breakdown (Total /100)**

- Choice of concept and plan sheet: /10 Due Friday, Dec. 5, 2014
- Day-to-day work and participation: /25 Continuous Evaluation
- Peer and self-assessments: /25 Taken at the end of every week
- Draft of documentation: /20 Due Friday, Dec. 19, 2014
- Final documentation: /20 Due Monday, Jan. 12, 2015

You have 20 designated school days to complete the project(s).

Each Friday you will be given a review assignment that is to be handed in the following Friday. These are not for marks and answers will be provided (when applicable) on the assignment to check your work. These assignments are to ensure you do not go over a month without reviewing the course content. Assignments will be photocopied and returned to you so you can continue reviewing.

**Due: Friday, December 5, 2014**

**Group Members** \_\_\_\_\_

**Concept/Project Details & Target Grade**

**How will you be demonstrating the concept? (Video, Digital Simulation, etc.)**

**Equipment required (Edgertronic Camera, HD camera, software, materials, etc.)**

**Resources to obtain (if you need to learn/review concepts)**

Name \_\_\_\_\_

Date \_\_\_\_\_

| Category                   | Excellent (4)                                                                                                                              | Good (3)                                                                                          | Satisfactory (2)                                                                                                          | Needs Improvement (1)                                                                                                              |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Attitude</b>            | Student is always respectful of his or her self, others, and teacher and has a positive attitude.                                          | Often has a positive attitude about the task(s). Usually treats others and self with respect.     | Occasionally has a positive attitude about the task(s) and behaves in a respectful manner.                                | Rarely behaves in a respectful manner.                                                                                             |
| <b>Focus on Class Work</b> | Consistently stays focused on in-class work and what needs to be done. Very self-directed.                                                 | Focuses on in-class work and what needs to be done most of the time.                              | Often must be reminded by the teacher or group about what needs to get done.                                              | Rarely focuses on class work and what needs to be done.                                                                            |
| <b>Contributions</b>       | Routinely provides useful ideas when participating in discussions. A definite leader who contributes a lot of effort.                      | Usually provides useful ideas when participating in discussions. A strong student who tries hard. | Sometimes provide useful ideas in discussion. A satisfactory student who does what is required.                           | Rarely provides useful ideas when participating in discussions. May refuse to participate.                                         |
| <b>Working with Others</b> | Almost always listens to, shares with, and supports the efforts of others. Students can feel safe volunteering in this student's presence. | Usually listens to, shares with, and supports the efforts of others.                              | Often listens to, shares with, and supports the efforts of others, but sometimes is not actively listening or responding. | Rarely listens to, shares with, and supports the efforts of others. Often disrupts or discourages others' attempts to participate. |
| <b>Time-Management</b>     | Routinely uses time well to ensure things get done on time. Student never asks to adjust deadlines.                                        | Usually uses time well, rarely misses deadlines.                                                  | Tends to procrastinate, does not use school time or schedule provided to get work completed.                              | Rarely gets work done by deadlines, always asks for extensions or does not submit work despite time in school.                     |
| <b>Behavior</b>            | Student is engaged in class on a daily basis, and shows no disruptive behavior.                                                            | Student is engaged in class nearly every day, and shows no disruptive behavior.                   | Student has done nothing for a few classes. Shows some disruptive behavior.                                               | Student frequently disrupts group or class.                                                                                        |

**Comments**

# Physics 112 Demo Project: Self-Evaluation

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My Name: \_\_\_\_\_

/48

Project: \_\_\_\_\_

## Week of Dec. 1 – 5, 2014

/12

Poor

Excellent

- |                                       |   |   |   |   |
|---------------------------------------|---|---|---|---|
| 1. Focus and staying on task          | 1 | 2 | 3 | 4 |
| 2. Participation in group discussions | 1 | 2 | 3 | 4 |
| 3. Contribution to project            | 1 | 2 | 3 | 4 |
| 4. Task(s) during this week was/were: |   |   |   |   |

5. Some steps I took advantage of to better understand this concept were: \_\_\_\_\_

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## Week of Dec. 8 – 12, 2014

/12

Poor

Excellent

- |                                       |   |   |   |   |
|---------------------------------------|---|---|---|---|
| 1. Focus and staying on task          | 1 | 2 | 3 | 4 |
| 2. Participation in group discussions | 1 | 2 | 3 | 4 |
| 3. Contribution to project            | 1 | 2 | 3 | 4 |
| 4. Task(s) during this week was/were: |   |   |   |   |

5. Some steps I took advantage of to better understand this concept were: \_\_\_\_\_

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## Week of Dec. 15 – 19, 2014

/12

Poor

Excellent

- |                                       |   |   |   |   |
|---------------------------------------|---|---|---|---|
| 1. Focus and staying on task          | 1 | 2 | 3 | 4 |
| 2. Participation in group discussions | 1 | 2 | 3 | 4 |
| 3. Contribution to project            | 1 | 2 | 3 | 4 |
| 4. Task(s) during this week was/were: |   |   |   |   |

5. Some steps I took advantage of to better understand this concept were: \_\_\_\_\_

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## Week of Jan. 6 – 9, 2015

/12

Poor

Excellent

- |                                       |   |   |   |   |
|---------------------------------------|---|---|---|---|
| 1. Focus and staying on task          | 1 | 2 | 3 | 4 |
| 2. Participation in group discussions | 1 | 2 | 3 | 4 |
| 3. Contribution to project            | 1 | 2 | 3 | 4 |
| 4. Task(s) during this week was/were: |   |   |   |   |

5. Some steps I took advantage of to better understand this concept were: \_\_\_\_\_

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# Physics 112 Demo Project: Peer Evaluation

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My Name: \_\_\_\_\_

Peer: \_\_\_\_\_

Project: \_\_\_\_\_

/64

## Week of Dec. 1 – 5, 2014

/16

Poor

Excellent

- |                                       |   |   |   |   |
|---------------------------------------|---|---|---|---|
| 1. Attendance                         | 1 | 2 | 3 | 4 |
| 2. Focus and staying on task          | 1 | 2 | 3 | 4 |
| 3. Participation in group discussions | 1 | 2 | 3 | 4 |
| 4. Contribution to project            | 1 | 2 | 3 | 4 |
5. Task(s) during this week was/were: \_\_\_\_\_

6. Concerns/Comments: \_\_\_\_\_

## Week of Dec. 8 – 12, 2014

/16

Poor

Excellent

- |                                       |   |   |   |   |
|---------------------------------------|---|---|---|---|
| 1. Attendance                         | 1 | 2 | 3 | 4 |
| 2. Focus and staying on task          | 1 | 2 | 3 | 4 |
| 3. Participation in group discussions | 1 | 2 | 3 | 4 |
| 4. Contribution to project            | 1 | 2 | 3 | 4 |
5. Task(s) during this week was/were: \_\_\_\_\_

6. Concerns/Comments: \_\_\_\_\_

## Week of Dec. 15 – 19, 2014

/16

Poor

Excellent

- |                                       |   |   |   |   |
|---------------------------------------|---|---|---|---|
| 1. Attendance                         | 1 | 2 | 3 | 4 |
| 2. Focus and staying on task          | 1 | 2 | 3 | 4 |
| 3. Participation in group discussions | 1 | 2 | 3 | 4 |
| 4. Contribution to project            | 1 | 2 | 3 | 4 |
5. Task(s) during this week was/were: \_\_\_\_\_

6. Concerns/Comments: \_\_\_\_\_

## Week of Jan. 6 – 9, 2015

/16

Poor

Excellent

- |                                       |   |   |   |   |
|---------------------------------------|---|---|---|---|
| 1. Attendance                         | 1 | 2 | 3 | 4 |
| 2. Focus and staying on task          | 1 | 2 | 3 | 4 |
| 3. Participation in group discussions | 1 | 2 | 3 | 4 |
| 4. Contribution to project            | 1 | 2 | 3 | 4 |
5. Task(s) during this week was/were: \_\_\_\_\_

6. Concerns/Comments: \_\_\_\_\_

Group \_\_\_\_\_

Project \_\_\_\_\_

| Category                                | Excellent                                                                                                        | Good                                                                                                                                      | Satisfactory                                                                                                                     | Needs Improvement                                                                                                                                                |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Submission (3)</b>                   | (3) Draft submitted by the due date.                                                                             | N/A                                                                                                                                       | (1) Not submitted by due date.                                                                                                   | (0) Not submitted at all.                                                                                                                                        |
| <b>Content (10)</b>                     | (10) All parts of the project are included. (Introduction, background, tutorials, worksheets, discussions, etc.) | (7) Missing one section of the project.                                                                                                   | (5) Missing two sections of the project.                                                                                         | (2) Missing more than two sections.                                                                                                                              |
| <b>Video or Simulation Tutorial (4)</b> | (4) Video has been recorded, edited and ready to use.<br>(4) Tutorial completed that includes screen captures.   | (3) Video has been recorded but a few minor edits remain.<br>(3) Tutorial mostly completed with a few edits or screen captures remaining. | (2) Video has been recorded but many edits remain.<br>(2) Tutorial started but far from completion. Many screen captures remain. | (1 or 0) Video is not recorded, or recorded with no editing.<br>(1 or 0) Tutorial not started or has a large amount of work remaining. No screen captures taken. |
| <b>Works Cited (3)</b>                  | At least 3 unique resources properly cited.                                                                      | 2 resources properly cited.                                                                                                               | 1 resource properly cited.                                                                                                       | No resources cited.                                                                                                                                              |

**Comments**

Group \_\_\_\_\_

Project \_\_\_\_\_

| Category                                   | Excellent                                                                                                                                                                                                                        | Good                                                                                                                                                                                                                       | Satisfactory                                                                                                                                                                                 | Needs Improvement                                                                                                                                                                      |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Concept Background (6)</b>              | (6) Background information is correct, very clearly worded, covers all aspects of the concept with proper terminology, is very detailed and easy to understand.                                                                  | (4) Background information is mostly correct with proper terminology but with a few wording problems and missing a few details.                                                                                            | (2) Background information contains many concept errors, wording problems, is not clear and missing details.                                                                                 | (0) Background information is incorrect, not well explained, and lacking of any detail.                                                                                                |
| <b>Video(s) or Simulation Tutorial (4)</b> | (4) Video(s) has been recorded, edited and ready to use. At least one variable is changed to aid in concept development.<br>(4) Tutorial completed that includes screen captures and clearly explains how to run the simulation. | (3) Video(s) has been recorded but a few minor edits should have been made. Video(s) are not as well produced.<br>(3) Tutorial mostly completed with a few edits necessary. Not quite as clearly explained as it could be. | (2) Video(s) has been recorded but many does not clearly help show the science concept. Production of video is satisfactory.<br>(2) Tutorial does not clearly explain how to use simulation. | (0) Video(s) makes very little or no connection to concept. Little care was put into its production.<br>(0) Tutorial is poorly written and does not explain how to use the simulation. |
| <b>Worksheets (7)</b>                      | (7) Worksheets show a clear development of concept(s). Points for discussion and explanations for teachers is included and well explained using proper terminology and detail.                                                   | (5) Worksheets contain sufficient detail and worksheets show a development of concept. Points for discussion are included but missing some important details.                                                              | (3) Worksheets require more questions leading to the development of the concept. Points of discussion and explanations for teachers are included but missing a lot of detail.                | (0) Worksheets do not help develop the concept and are poorly worded. Explanations for teacher in missing or very poorly explained.                                                    |
| <b>Works Cited (3)</b>                     | At least 3 unique resources properly cited.                                                                                                                                                                                      | 2 resources properly cited.                                                                                                                                                                                                | 1 resource properly cited.                                                                                                                                                                   | No resources cited.                                                                                                                                                                    |

**Comments**

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