**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period:\_\_\_\_\_\_\_\_Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Rube Goldberg Machines**

You become the inventor! Each group in class will design a Rube Goldberg Machine to analyze and share with the class. You will also be required to present your Machine in one of the formats explained below and will receive a grade from your group and your teacher based on your participation and effort throughout the project. It is recommended that you obtain contact information for your group members.

There are 3 major components to your Rube Goldberg Project: Planning, Design, and Presentation. Please see the rubrics for more detailed expectations.

|  |  |
| --- | --- |
| **Planning** | * Using work time appropriately * **Blueprints completed and turned in by the beginning of class on May 5/20** * Blueprints are well thought-out and realistic |
| **Design** | * Design a unique Rube Goldberg Machine * Have at least six different steps * Must include one of each simple machine (inclined plane, pulley, and lever) * Label all simple machines on the poster. * Represent the design of your machine on a poster. * Design must include 4 energy transfers and 4 energy transformations. * Diagram all energy transfers and transformation that happen in your machine. |
| **Presentation** | Your group will select **one** of the following presentation formats for your machine:   * Create a comic book that features all aspects of your machine, and tells a relevant story   + Must be at least 10 pages * Build a physical working model of your machine in class * Create an infomercial video advertising your machine, perhaps it can do something special   + Must include script and story board (10 frames) * Create a music video featuring your machine   + Must include script and story board (10 frames)   **Your group must decide by the end of class on May 19th which presentation style you will be doing AND officially declare it to your teacher. You will NOT be allowed to switch your presentation component after declaration.** |
| **Peer Scores** | At the end of the project you will evaluate the people in your group on a scale (1-10). We will compile those scores to give you a percentage for a score out of 10. This will be based on your effort and participation in the group work. |

Schedule:

|  |  |
| --- | --- |
| **Date** | **In Class** |
| 5/19 | Planning time with your group in class |
| 5/19, 5/20, 5/23 | Work time for your project |
| 5/24 | Presentation of projects |

**Rube Goldberg Machine Grading Rubric**

**Planning:** This grade will be assessed at the end of the week of work time (May 24).

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| --- | --- | --- | --- | --- | --- |
| (35 total) | **Exceptional** | **Meets Standard** | **Approaching Standard** | **Needs Improvement** | **Unsatisfactory** |
| Use of Work Time *(this is an individual component of your grade)*  *(15pts)* | Uses all work time in class appropriately; suitably schedules extra time to work outside of class if needed.  *(15-14 pts)* | Uses all work time in class appropriately. *(13 pts)* | Spent less than 15% of available work time off-task.  *(12-10 pts)* | Spent between 15% and 30% of the available work time provided in class off-task.  *(9-7 pts)* | Spent more than 30% of the available work time provided in class off-task. *(6-0 pts)* |
| Blueprint – timeliness  *(3pts)* |  | Blueprint is completed by the beginning of class on 5/20  *(3 pts)* | Blueprint is completed by the middle-end of class on 5/20  *(2 pts)* | Blueprint is completed on by 5/23  *(1pts)* | Blueprint is not completed.  *(0 pts)* |
| Blueprint – presentation  *(10 pts)* | Blueprint is: on large paper (provided), is neatly drawn in great detail, is easy to understand, with components all carefully labeled  *(10 pts)* | Blueprint is: on large paper (provided), is neatly drawn, is easy to understand, with components all labeled  *(9-8 pts)* | Blueprint is: on large paper (provided), is neatly drawn or easy to understand, with components labeled  *(7-6 pts)* | Blueprint is: on large paper (provided), is neatly drawn or easy to understand, is missing labels  *(5-4 pts)* | Blueprint is not completed.  *(3-0 pts)* |
| Blueprint – reasonable  *(7 pts)* | Blueprint shows a design that can be reasonably built from available materials; specific materials are indicated  *(7 pts)* | Blueprint shows a design that can be reasonably built from available materials; likely materials are indicated  *(6-5 pts)* | Blueprint shows a design that can be reasonable built from available materials; materials are not indicated  *(4-3 pts)* | Blueprint shows a design that may not be reasonably built  Or  How realistic the design is cannot be seen in blueprint  *(2-1 pts)* | Blueprint is not completed.  *(0 pts)* |

**Design:** This rubric references the Rube Goldberg Machine you designed and its visual representation. Depending on your presentation component, you may or may not have constructed your machine.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (58 total) | **Exceptional** | **Meets Standard** | **Approaching Standard** | | **Needs Improvement** | | **Unsatisfactory** |
| Unique Design  *(4 pts)* |  | 100% of the design is unique to the students and does not resemble a machine from a different source  *(4 pts)* | 90% or more of the design is unique to the students and does not resemble a machine from a different source  *(3 pts)* | | 89% to 80% of the design is unique to the students and does not resemble a machine from a different source  *(2 pts)* | | 79% or less of the design is unique to the students and does not resemble a machine from a different source  *(1-0 pts)* |
| Visual Representation  *(9 pts)* | Detailed diagram that identifies all components of the design so that it could be easily replicated  *(9 pts)* | Detailed diagram that identifies all components of the design so that it could be replicated  *(8-7 pts)* | Diagram identifies most components of the design so that it could be replicated  *(6-5 pts)* | | Diagram shows most components of the design  *(4-3 pts)* | | Diagram is incomplete or unclear.  *(2-0 pts)* |
| Simple Machines – included  *(10 pts)* | Design includes the 3 types of simple machines and a total of 5 simple machines in design  *(10 pts)* | Design includes the 3 types of simple machines and a total of 4 simple machines in design.  *(8 pts)* | Design includes the 3 types of simple machines  *(6 pts)* | | Design includes 2 different types of simple machines  *(4 pts)* | | Design includes only 1 simple machine.  *(2 pts)* |
| Simple Machines – labeled  *(12 pts)* | All simple machines used are properly and specifically (i.e. 1st class, 2nd class, etc) labeled.  *(12 pts)* | All simple machines used are properly labeled.  *(11-10 pts)* | More than 50% of the simple machines used are labeled | Labeling contains minor inaccuracies | Less than 50% of the simple machines used are labeled | Labeling of >50% contains major inaccuracies | No simple machines are correctly labeled.  *(3-0 pts)* |
| *(9 for <100%*  *8 for <75%*  *7 for <60%)* | | *(6 for > 40%*  *5 for >25%*  *4 for >10%)* | |
| Steps (sections of the compound machine) *(7 pts)* | Design includes more than 6 steps *(7 pts)* | Design includes 6 steps *(6 pts)* | Design includes 5 steps *(5 pts)* | | Design includes 4 steps *(4 pts)* | | Includes 3 steps or fewer *(3-0 pts)* |
| Energy Transfers and Transformations – included  *(8 pts)* | Design contains 4 or more transfers and 4 or more transformations  *(8-7 pts)* | Design contains 3 transfers and 3 transformations.  *(6 pts)* | Design contains 2 transfers and 2 transformations.  *(5 pts)* | | Design contains at least 1 transfer and at least 1 transformation  *(4 pts)* | | Design does not contain energy transfers or transformations  *(3-0 pts)* |
| Energy Transfers and Transformations - labeled  *(8 pts)* | Design accurately identifies 100% of the energy transfers and transformations  *(8pts)* | Design accurately identifies 75% of the energy transfers and transformations  transformations  *(7-6 pts)* | Design accurately identifies 50% of the energy transfers and transformations  transformations  *(5-4 pts)* | | Design accurately identifies 25% of the energy transfers and transformations  *(3-2 pts)* | | Design accurately identifies no energy transfers or transformations  *(1-0 pts)* |

**Comic Book**

The comic book option should be an artistic expression of your Rube Goldberg machine, which ties it into some interesting plot. Comic books must be a certain length, and the story must be your own. If you wish to do a spoof or satire based on a well-known story, please check with your teacher in advance. It is important that your comic book go beyond the role of your visual representation (see design rubric), because you will include both in your final product.

**Presentation:** The rubrics below refer to your presentation component. There is a separate rubric for each presentation format (comic, music video, infomercial, or physical machine you’ve constructed). Make sure you are using the appropriate rubric when planning.

**Comic Book Rubric**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 22 pts | **Exceptional** | **Meets Standard** | **Approaching Standard** | **Needs Improvement** | **Unsatisfactory** |
| Length (4 pts) | Contains more than 10 pages, the majority of which feature the plot, not just the machine (4 pts) | Contains 10 pages, the majority of which feature the plot, not just the machine (3 pts) | Contains 9-8 pages, the majority of which feature the plot, not just the machine(2 pts) | Contains 7-5 pages, the majority of which feature the plot, not just the machine (1 pt) | Contains 4 or fewer frames and/or the machine is the major factor for the majority of the frames (0 pts) |
| Visual Appeal (10 pts) | Comic is especially well constructed, colorful, and professional; obviously the result of much effort; visuals are clear (10 pts) | Comic is well put together, colorful, and professional; visuals are clear. (8-9 pts) | Comic is well put together and colorful; visuals are clear (7-5 pts) | Comic is colorful, or well put together; visuals may not all be clear  (4-3 pts) | Comic is not colorful and/or well put together; visuals are mostly unclear (0-2pts) |
| Relevant Story (4 pts) |  | There is an original storyline that goes beyond the machine. (4 pts) | There is an original storyline that depends mostly on the machine (3 pts) | The storyline is not original, and depends mostly on the machine (2 pts) | The storyline is not at all original, and/or depends entirely on the machine (0-1 pts) |
| Includes Rube Goldberg Machine (4 pts) | The machine you designed is cleverly featured in your comic’s storyline. (4 pts) | The machine you designed is featured in your comic’s storyline. (3 pts) | The machine you designed is relevant to your comic’s storyline. (2 pts) | The machine you designed is only weakly connected to the storyline (1 pt) | The machine has nothing to do with the storyline  Or  There is no storyline . (0 pts) |

**Physical Machine**

The physical machine is your Rube Goldberg design come to life. You will construct the machine you designed so that it can run during class. Your group will need to plan a presentation of this machine, that incorporates running it, to show to an audience.

**Presentation:** The rubrics below refer to your presentation component. There is a separate rubric for each presentation format (comic, music video, infomercial, or physical machine you’ve constructed). Make sure you are using the appropriate rubric when planning.

**Physical Machine Rubric:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 22 pts | **Exceptional** | **Meets Standard** | **Approaching Standard** | **Needs Improvement** | **Unsatisfactory** |
| Completion and Restarts (12 pts) | Machine runs from start to finish without needing assistance from the group. (12 pts) | Machine runs from start to finish with only minor assistance from the group. (11-9 pts) | Machine runs from start to finish with repeated minor assistance from the group. (8-5 pts) | Machine runs from start to finish with serious repeated assistance from the group. (4-1 pts) | Machine does not run from start to finish (0 pts) |
| Original machines (6 pts) |  | Machine does not contain any pieces which are preassembled. (6-5 pts) | Machine contains only one piece which is preassembled (4-3 pts) | Machine contains multiple pieces which are preassembled (2-1 pts) | Machine contains almost entirely pieces which are preassembled (0 pts) |
| Presentation (4 pts) | Group is prepared and fully engages the audience throughout the presentation; presentation goes beyond simply running the machine. (4 pts) | Group is prepared and engages audience during presentation; presentation goes beyond simply running the machine (3 pts) | Group is prepared; presentation goes beyond simply running the machine (2 pts) | Group is unprepared  Or  Presentation only includes running the machine (1 pt) | Group is unprepared and presentation is simply running the machine (0 pts) |

**Music Video:** Your video will be posted on the Dropbox on your instructor’s Haiku either as a file or link PRIOR to class on the due date. If the video cannot be opened, you can only receive credit for the storyboard. All other components below will be a zero. Your music does not need to be an original composition, but it can be if you’ve got talent. As in all high-quality music videos, the beat and tone of the music should coordinate with the movement of the machine. The plot of your music video does not need to be complex, but must extend beyond running your machine.

Please, only school appropriate clothing and music in your video. A video that includes inappropriate clothing or music may earn no credit. **Please do include a full citation for the music**, or make it clear if it was created by you. A project that does not cite the source of the music may not earn credit. Your video should not include any “bloopers.”

**Presentation:** The rubrics below refer to your presentation component. There is a separate rubric for each presentation format (comic, music video, infomercial, or physical machine you’ve constructed). Make sure you are using the appropriate rubric when planning.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 22 pts | **Exceptional** | **Meets Standard** | **Approaches Standard** | **Needs Improvement** | **Unsatisfactory** |
| Storyboard  (4 pts) | Contains more than 10 frames, the majority of which feature the plot, not just the machine 4 pts | Contains 10 frames, the majority of which feature the plot, not just the machine 3 pts | Contains 9-8 frames, the majority of which feature the plot, not just the machine 2 pts | Contains 7-5 frames, the majority of which feature the plot, not just machine (1 pts) | Contains 4 or fewer frames and/or the machine is the major factor for most frames (0 pts) |
| Script (4 pts) | Complete script is in a professional typed format; includes the lyrics (or instrumental progression); lyrics or progression precisely match the stages of the machine. (4 pts) | Complete script is in a professional typed format; includes the lyrics (or instrumental progression); lyrics or progression match the stages of the machine. (3 pts) | Complete script is in a professional typed format; includes the lyrics (or instrumental progression.  Or  Script is not typed, but lyrics or progression match the stages of the machine. (2 pts) | A handwritten copy of the complete script is turned in, including lyrics (or instrumental progression). (1 pt) | No script is provided or an incomplete or nonsensical script is provided. (0 pts) |
| Visual Appeal (10 pts) | Video is well put together and professional, and interesting. (10 pts) | Video is well put together and professional. (9-7 pts) | Video is well put together or professional; video is clear(6-4 pts) | Video is well put together; video may not be totally clear (3-1 pts) | Video is not clear. (0 pt) |
| Music (4 pts) | Music completely aligns with the machine; the beat matches the pace and movement of the machine. Music is classroom appropriate. (4 pts) | Music aligns with machine in a logical way; the majority of the beat matches the pace and movement of the machine. Music is classroom appropriate. (3 pts) | Connection between music and machine is unclear; the majority of the beat matches the pace and movement of the machine. Music is classroom appropriate. (2 pts) | Connection between music and machine is unclear; the majority of the beat does not match the pace and movement of the machine. Music is classroom appropriate. (1 pt) | Connection between music and machine is unclear; beat does not match the machine. Music is not classroom appropriate. (0 pts) |

**Infomercial:** Your video will be posted on the Dropbox on your instructor’s Haiku either as a file or link. If the video cannot be opened you will receive a zero on this component. An infomercial is a form of television commercial, which generally includes a phone number or website. You do not need to create a new website or give your actual phone number. Your infomercial does not need to be selling your machine, but your machine should be a prominent feature in the commercial. Please, only school appropriate clothing and content in your video. Videos with inappropriate clothing or content may not receive credit. Your video should not include any “bloopers.”

**Presentation:** The rubrics below refer to your presentation component. There is a separate rubric for each presentation format (comic, music video, infomercial, or physical machine you’ve constructed). Make sure you are using the appropriate rubric when planning.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 22 pts | **Exceptional** | **Meets Standard** | **Approaching Standard** | **Needs Improvement** | **Unsatisfactory** |
| Storyboard  (4 pts) | Contains more than 10 frames, the majority of which feature the plot, not just the machine 4 pts | Contains 10 frames, the majority of which feature the plot, not just the machine 3 pts | Contains 9-8 frames, the majority of which feature the plot, not just the machine 2 pts | Contains 7-5 frames, the majority of which feature the plot, not just machine (1 pts) | Contains 4 or fewer frames and/or the machine is the major factor for most frames (0 pts) |
| Script (4 pts) | Complete script is presented in a professional typed format; includes the person saying each line; includes visual cues. (4 pts) | Complete script is presented in a professional typed format; includes the person saying each line. (3 pts) | Complete script is presented in a typed semi-professional format. (2 pts) | A handwritten copy of the complete script is turned in. (1 pts) | No script is provided or an incomplete or nonsensical script is provided. (0 pts) |
| Visual Appeal (10 pts) | Video is well put together and professional, and interesting. (10 pts) | Video is well put together and professional. (9-7 pts) | Video is well put together or professional; video is clear(6-4 pts) | Video is well put together; video may not be totally clear (3-1 pts) | Video is not clear. (0 pt) |
| Relevant Story (4 pts) | The machine is cleverly tied to the story. (4 pts) | There is an original storyline that goes beyond the machine. The machine you designed is featured in your video’s storyline. (3 pts) | There is an original storyline that depends mostly on the machine. The machine you designed is relevant to your video’s storyline (2 pts) | The storyline is not original, and depends mostly on the machine. The machine you designed is only weakly connected to the storyline. (1 pt) | The storyline is not at all original, and/or depends entirely on the machine  OR  Does not relate to machine.  (0 pts) |