
PHYSICS: ELECTRICITY BOARD GAME ASSIGNMENT

Group Members (4 max): _____

Due Date: _____

Purpose:

- To demonstrate your understanding of electricity, to create various electric circuits, and to review the electricity unit

Task: Create and design a board game that contains working circuits. Parts are to be provided by students and may be purchased from hardware stores (SAYAL Electronics, KIDDER, AZ Electronics, The Source, Canadarobotix, A1 Electronic Parts), Home Depot, scavenged items from dollar store items, or items from home (Christmas lights, old electronic toys) with parental permission.

Note: Check the store website's online and plan accordingly before purchasing

- **MAXIMUM BUDGET LIMIT of \$5-10 per person**
- Some items come in packages, so work with other groups to split the cost

Required Components for the Circuit:

- Must be independently working circuits (can NOT be plugged into a wall outlet)
- It must include at least one series and one parallel circuit that produce a predictable outcome
- There must be 2 different loads that indicate the circuit is working {ex. Lights [lightbulb(s) or LED(s)], buzzer(s)/bell(s), motor(s), loudspeaker, fan(s), etc.}
- The loads should be incorporated into the game creatively (ex. buzzer sounds when playing the game operation or a switch to buzz in to answer the question)
- The ability to control the circuit (switch or dimmer)
- The circuit should be neat and attractive, and easy to follow (fasten or tape down the wires if needed)

Required Components for the Individual Component:

- Each **individual** must create 8 review questions on the main topics of the electricity unit that are to be used in the game
 - Half the questions should be about Static electricity and the other half should be about Current electricity
 - → Static Electricity Topics: Friction, Contact, Induction, Insulators/Conductors, Applications of Electricity
 - → Current Electricity Topics: Current, Voltage, Resistance, Power Generation, Circuit Diagrams, Efficiency, Series and Parallel Circuits, Cost of Electricity
- Each person must have questions that cover most or all of the main topics (ex. all static questions cannot be about induction)
- Full solutions to all questions must be included
- Students must submit the actual gaming cards with the questions and answers
- Please write your name on your gaming cards to indicate the questions/answers you created
- Written evidence of each person's contributions (the teacher will provide a sheet to fill in for this section after the presentations)

Required Components for the Group Component:

- Written evidence of **brain storming** about circuits, game design & ideas, difficulties in planning, including dates of discussion and group members present
- A circuit diagram of each circuit and a caption below indicating **how the loads** are incorporated into the game
- **Written report** with clear and concise instructions that explain the rules and how to play the game
- **Group presentation** on how the game works (both game play and circuits)

Please staple #1 to 4 as a package and hand in with your board game along with the evaluation rubric and gaming cards:

1. Rules and how to play the game
2. All brainstorming ideas
3. Circuit Diagrams
4. Materials Cost Sheet
5. Individual Gaming Cards (please rubber band together or place inside a Ziploc bag)
6. 1 copy of the Evaluation Rubric

EVALUATION RUBRIC

	What?	I almost got it	I got it	Ask me anything!	Total
Knowledge and Understanding [11]					
Review Questions (Individual)	# of questions is far below required amount	There is about half the # of required questions	There are the correct # of questions	There are the correct # of questions	_____ /8
	Questions generally do not cover the required topics	Questions do not cover many of the main topics	Questions do not cover some of the main topics	Questions cover most or all the main topics of the electricity unit	_____ /8
	Questions are far too simple or difficult for students in grade 9 science	Most questions are too simple or difficult for students in grade 9 science	Most questions are appropriate for grade 9 science students	All questions are appropriate for a grade 9 science students	_____ /8
	All or most of solutions are incomplete or incorrect	Half the solutions are incomplete or incorrect	The majority of solutions are correct	All solutions are correct	_____ /8
	0 1	2 3 4	5 6 7	8	_____ /8
Instructions	No instructions are included	The instructions are too basic/difficult to follow	Instructions a bit confusing Instructions are clear but too long	Instructions clear and concise No confusion	_____ /3
	0	1	2	3	

	What?	I almost got it	I got it	Ask me anything!	Total
Thinking & Investigation [10]					
Evidence of brainstorming and work contributed by individual group members	No evidence of brainstorming or member contributions 0	Little evidence that discusses ideas & difficulties in planning & member contributions 1	Some discussion of ideas & difficulties in planning & member contributions 2 3	Complete journal with dates, ideas, difficulties in planning and executing the project & member contributions 4 5	/5
Circuit Diagrams	No circuit Diagrams included 0	Circuit Diagrams do not accurately reflect the board game Circuit symbols incorrect 1 2	Circuit diagram is generally accurate A few circuit diagrams are incorrect 3 4	Circuit diagram is accurate All circuit symbols are correct Diagrams are neat and visually appealing 5	/5

	What?	I almost got it	I got it	Ask me anything!	Total
Application [12]					
Complexity and Creativity of Game	Circuit is incomplete, but present, game is very basic 0 1	Game includes only one simple series circuit Game is somewhat creative, but does not involve the circuit 2	Game only includes one type of circuit/load Some creativity to involve circuit into game 3 4	Both parallel and series circuits included, more than one type of load and integration of circuit into game is creative 5 6	/6
Functionality of Game	Game does not work at all 0	Not all Circuit(s) or loads work/does not work well 1	All circuits work, but not the way stated 2	All circuits and loads work the way stated 3	/3
Member Contribution & Collaboration (Individual)	Member contributed drastically less than other members of group or no record 0 1	Member contributed less than rest of group or vague record 2 3 4	Member contributed the same as most group members 5 6 7	Members contributed equally, or member contributed significantly more than group members 8 9 10	<hr style="width: 100px; margin-bottom: 5px;"/> /10 <hr style="width: 100px; margin-bottom: 5px;"/> /10 <hr style="width: 100px; margin-bottom: 5px;"/> /10 <hr style="width: 100px; margin-bottom: 5px;"/> /10