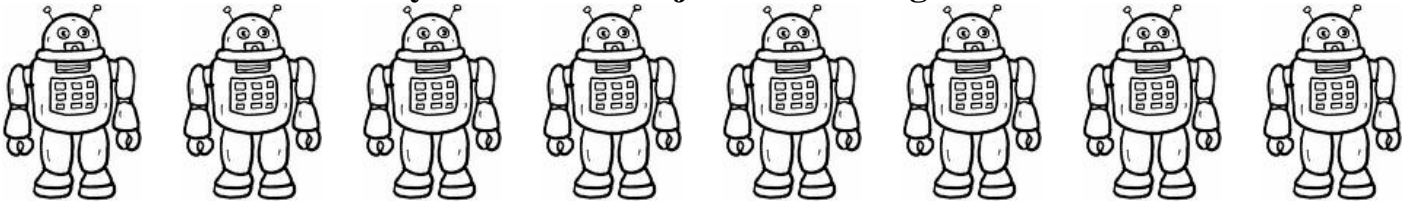


## Physics Circuit Project: Answering Robot



### Challenge for each student pair:

Build a robot that has the ability to indicate which answer is correct when given special multiple choice review question cards that you make.

### Robot Guidelines:

1. Robot must indicate the correct answer by doing something obvious such as a light turns on, a sound buzzes, some part moves, etc...
2. Robots must be homemade- no toys, kits, or pre-made robotics.
3. Individual parts such as lights, buzzers may be purchased but most of robot should come from common inexpensive household items.
4. Robot should be made so its internal workings/wires can be inspected by teacher.
5. Best robots will have strong connections (wire nuts/solder), long flexible wires, at least 2 strong signals (probably in parallel), look unique & fun

Performance (10 pts)	Appearance (10 pts)	Ease of use (10 pts)	Cards (10 pts)
Doesn't work	no features	very difficult	1 card = 2 points
Needs assistance	some details	needs assistance	2 cards = 4 points
Weak/intermittent	Neutral	Adequate	3 cards = 6 points
Strong signal	Attractive	Reliable	4 cards = 8 points
Multiple signals	Excellent	Enjoyable	5 cards = 10 points

Grade = 100% \* Total Points / 40, the best ones in class will get A+ (10/10) for any particular category

**About the cards:** Make 5 cards having a multiple choice question and at least 3 answers. The questions should be your own, & helpful for finals. The card is made of 2 index cards stapled together. The front card has the question with an answer hole, and holes for answers A, B, C, D, etc. The front of the inside card has a piece of aluminum foil for the question and answer holes, as well as a longer piece of foil connecting the question hole to the correct answer hole.

### Sample wiring

<p>At right shows how to wire the inside of a question card. The grayed blocks represent conductive metal foil cut-outs.</p>		<p>The circuit patter at left is wired so the correct choice is A.</p>
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### Tips:

- Try to get two strong signals for performance. Usual signals include: sound, motion, lights.
- Appearance should impress people and it should be obvious effort went into the appearance.
- Ease of use will require long, reasonable flexible arms. A user should be able to test all possible answers with the card on the table and without having to bend the robot body forward.
- At least one card per deck will be checked by me; additionally, cards will be checked by your peers. Make good questions with the correct answer. If I spot a wrong answer or a bad question, I will check that deck more carefully.

## Physics Circuit Robot: Judgment Day!

Your name or student ID: \_\_\_\_\_

*The robot project will also have a theme of some kind. The theme should be clever and creative and it should be carried out consistently within the robot and the question cards. It is expected that you will use class time wisely in this project and come up with meaningful questions.*

***On presentation day,** I will ask you to visit the various projects and see how useful they are in helping you to study and also how impressed you are with the quality of the various project. I want you to do this judging with your partner in order to encourage a discussion about the strengths and weaknesses of the projects.*

### **Guidelines**

1. Robot must indicate the correct answer by doing something obvious such as a light turns on, a sound buzzes, some part moves, etc...
2. Robots must be homemade- no toys, kits, or pre-made robotics. Individual parts such as lights, buzzers may be purchased but most of robot should come from common inexpensive household items.
3. Robot should be made so its internal workings/wires can be inspected
4. Best robots will have strong connections (wire nuts/solder), long flexible
5. Wires, at least 2 strong signals (probably in parallel), look unique & fun

### **Rubric**

Performance	Appearance	Ease of use	Cards
Doesn't work	No features	Difficult to use even with help	2 points per card up to 5 cards
Needs assistance	Some details	Needs assistance (hard to do by yourself)	
Weak or intermittent signal	Neutral	Can do by yourself, but challenging (short arms, etc.)	
Strong signal	Attractive	Reliable and reasonably easy to use	
Best in class/very impressive!	Excellent	Simple to use, so it's fun!	

List in order the top 4 performing robots by categories. Please, don't include your own robot. Include name of at least one member of group.

Place	Performance	Appearance	Ease of use	Cards
Best in this category				
2 <sup>nd</sup> best				
3 <sup>rd</sup> best				
4 <sup>th</sup> best				

All things considered. The best robot & 2<sup>nd</sup> best robot overall were which ones and why do you think so?