

# FIVE SIMPLE LESSONS

## **Suggested Dot Points for Teachers - Software**

The Ed-Blocs website is <http://www.ed-blocs.com> with quick links and downloads.

Students work individually on a Mac or PC connected to the Internet and login to <http://ed-blocs.com/software>.

The software is intended to be self-paced making it good to allocate as homework as it requires no school resources and no teacher time.

To get individual student report cards they need to be set up in the admin login area. <http://ed-blocs.com/software/administrator/>

If your school already uses Ed-Blocs see your school Ed-Blocs administrator or if they haven't yet, request your school and give the name & email of your proposed school administrator via email to [pgkpeter@gmail.com](mailto:pgkpeter@gmail.com).

Some students are hands-on learners and the hardware allows them to show themselves. If the school has the Ed-blocs hardware, there is an enhanced learning possibility. There is a download student work book and teacher manual on the website for the first five simple lessons for case one. If a school has a full set then students can set up and test each lesson after they have done the exercises. Students love hands on learning.

## **Suggested Dot Points for Teachers - Hardware**

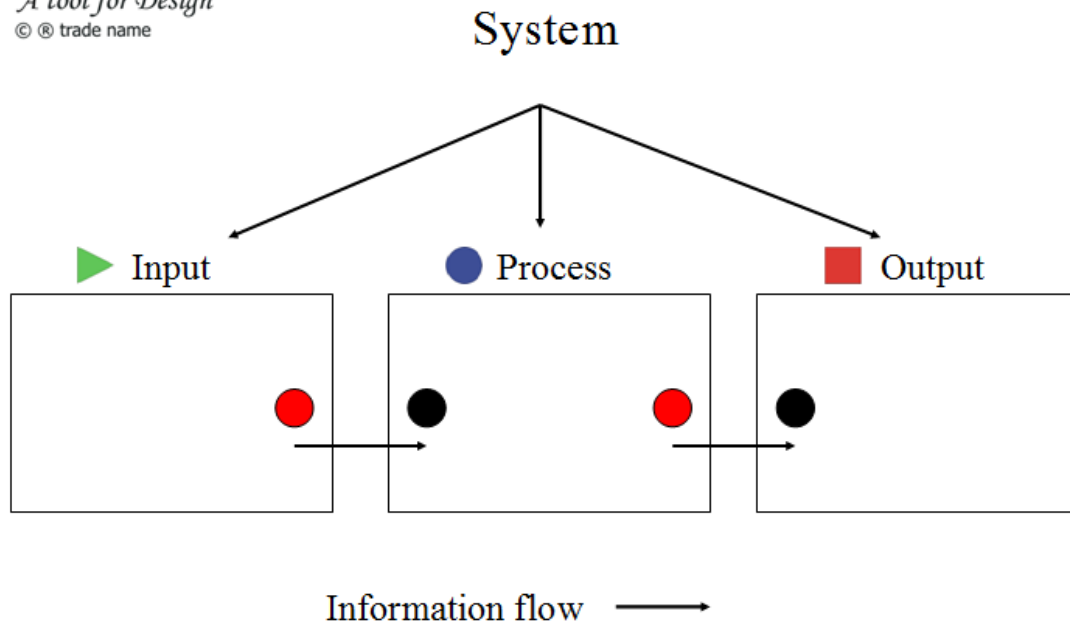
Make a team of six or less, a team of four is ideal.

Give each team one of the following

- 1) Talking stick (wooden spoon) - optional
- 2) Throwing "dice"
- 3) Name Tags (these are included to print on adhesive printing paper)

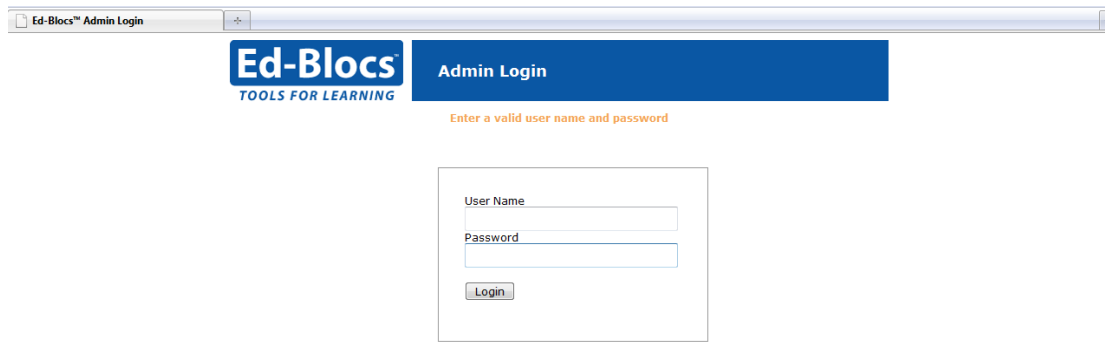
### **Ed-Bloc Investigation Lesson Structure**

- Organisation of roles  
The throwing of the dice determines the leader – highest number becomes the leader (only those who haven't been a leader get to roll the dice). The leader takes control of the team and delegates by his/her decision whom does which role (Data Recorder, Handler, Handler's assistant, Card reader, Results presenter). It is the leader's responsibility to ensure everyone has a chance to express their ideas to the team and that only one person speaks at a time by deciding who has the talking stick (wooden spoon).
- Block hands-on investigation - teams explore the Ed-Bloc without the Ed-Blocs information card. Allow students to explore the Ed-Bloc(s) discovering all the combinations available to get it to function. Get groups to explain their findings, then hand out the Ed-Bloc information card.
- When all Ed-Blocs needed for a design challenge has been investigated give the design challenge to the team leader.
- Students must present their hypothesis solution to the teacher using the Ed-Blocs info cards before, bring allowed to test and possibly fix their design.



TEAM / GROUP	ROLES
TEAM LEADER	The leader is chosen by rolling a dice - highest number becomes the leader. Only those who haven't been a leader get to roll the dice. The leader takes control of the team and delegates by his decision who does which role. It is his responsibility to ensure everyone has a chance to express ideas to the team and that only one person speaks at a time - deciding who has the talking stick (wooden spoon).
DATA RECORDER	Records all information / results for the team on this work sheet.
CARD READER	Holds and reads Ed-blocs cards for the team. Note Ed-blocs information cards are not to be used during the teams first attempt. Students are to work as a team to explore its function for themselves.
Ed-blocs HANDLER	Controls all handling and connecting of Ed-blocs for the team.
HANDLER ASSISTANT	Assists and takes directions from the Ed-blocs HANDLER
RESULT PRESENTER and TIME KEEPER	Presents the teams findings and conclusions to the teacher and other teams / students. Advises the team the time left. For example teams are allocated 15 minutes to explore an Ed-blocs, so each 5 minute express to the team 10 minutes to go, 5 minutes to go, etc.

## FIVE SIMPLE LESSONS TEACHER MANUAL



Ed-Blocs™ Admin Login

**Ed-Blocs**  
TOOLS FOR LEARNING

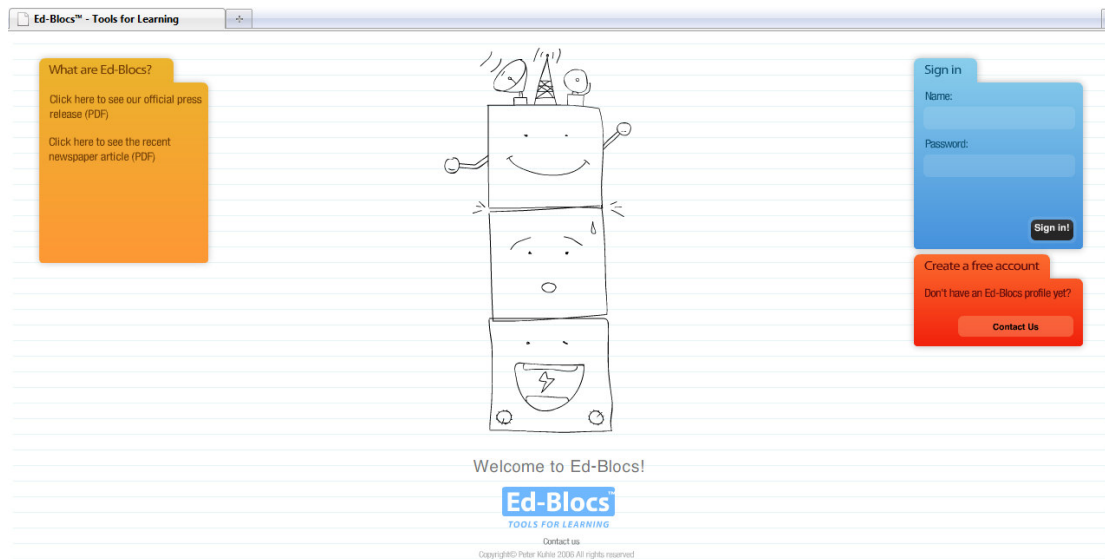
**Admin Login**

Enter a valid user name and password

User Name  
Password  
Login

### Admin log in webpage

A school administrator sets up classes and teacher login's  
Teachers then create student login's and activate lessons the class see (homework).



Ed-Blocs™ - Tools for Learning

What are Ed-Blocs?  
Click here to see our official press release (PDF)  
Click here to see the recent newspaper article (PDF)

Sign in  
Name:  
Password:  
Sign in!

Create a free account  
Don't have an Ed-Blocs profile yet?  
Contact Us

Welcome to Ed-Blocs!

**Ed-Blocs**  
TOOLS FOR LEARNING  
Contact us  
Copyright© Peter Kuhle 2005-2009 All rights reserved

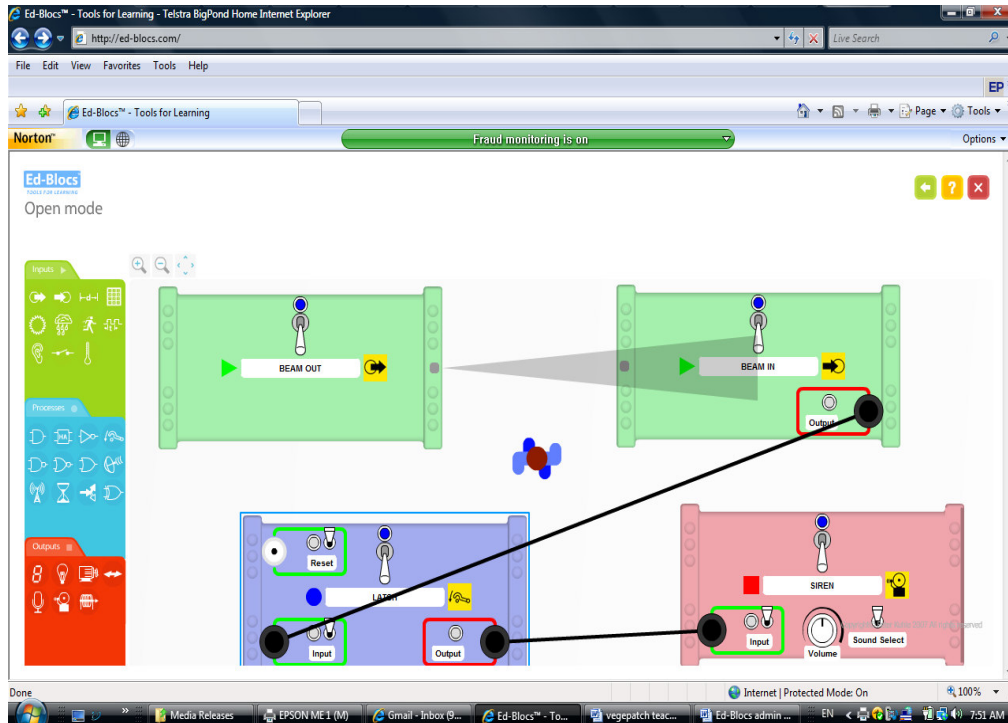
### Student's login webpage

Self-paced lessons – no school resources and no teacher time.

## FIVE SIMPLE LESSONS TEACHER MANUAL



All 32 Ed-Blocs circuit boards are available as kits so teachers and students can build their real world design challenge solutions and actually use them. The kit info also helps students to understand the components that together achieve each block's unique function.



All Ed-Blocs are simulated and connect in software. Leads delete automatically when not connected to anything and to delete a block left mouse click on it and hit the delete button.



# Frequently Asked Questions

## What are Ed-Blocs™?

Ed-Blocs are a combination of 32 individually powered electronic building blocks, each with a unique and powerful function. They engage enquiring minds and have a supporting software that requires no school resources and no teacher time.

## Are Ed-Blocs™ safe for student use?

Ed-Blocs have been designed for use by primary school students. They are safe, robust and effective at promoting self - logical thinking and team.

## What age ranges are Ed-Blocs™ designed for?

The pre-assembled Ed-Blocs hardware is probably be of most benefit to “Middle Phase” students from around Year 4-6. Depending upon the outcomes that you are looking for, they could also benefit student's right up to Year 11 or 12 as the design and assembly notes for building electronics kits of duplicate Ed-Blocs™ are included on the website. So you can learn, design, simulate, prototype here.

## What subject/curriculum are the Ed-Blocs™ suited to?

Ed-Blocs™ were designed and refined in Australian schools to suit a curriculum that encourages student design and creativity. This does not restrict them to this curriculum or geographic region. The blocks and activities support any curricula that promotes - team work, project based learning, creativity and design elements. It solidly meets a modern school early entry Technology syllabus and goes on to support any school offering secondary elective electronics.

## How does the online software compliment the Ed-Blocs™?

The software has online learning modules which allow full software simulation of all the blocks. This allows for students to test their hypothesis “onscreen” prior to awaiting their turn to try it for real on the blocks. In this way the product use is extended beyond the classroom and to cater for larger classes.

## Will there be additional activities and more curriculum mapping carried out?

Ed-Blocs™ is keen to develop and support the work of innovative, forward-thinking educators looking to inspire students to greater creativity and thinking. If schools are going to embrace the product then the development team will work with the schools to create materials suited to the school's program.

## Where can I get more information about Ed-Blocs™?

Initially contact Peter Kuhle by email [pgkpeter@gmail.com](mailto:pgkpeter@gmail.com) Peter can put you in touch with the person in your region who can best offer you the support that you need to inspire maximum creativity in your students.



Team Leader



Team Leader



Data Recorder



Data Recorder



Card Reader



Card Reader



Handler



Handler



Handler Assistant



Handler Assistant



Results Presenter  
and Time Keeper



Results Presenter  
and Time Keeper

## **Lesson 1 – Monitor a doorway.**

### **Outcomes**

TP 3.1, 4.1, 5.1

Students are taught the unique function and identifying symbols of the input Ed-Blocs – *Beam In* and *Beam Out* and the output Ed-Bloc – *Light*. Students are to investigate Ed-Blocs and confirm their function

TP 3.3, 4.3, 5.3

Students are to incorporate the Ed-Blocs into a design challenge they have been set. They are then to test their design and if wrong, investigate, fix and record why. Students must answer questions related to the Ed-Blocs and the design challenge.

### **Overview**

*Please use the “Suggested dot points for teachers” sheet for ways in which to introduce and allow students to investigate selected Ed-Blocs.*

Students are introduced to the two input Ed-Blocs *Beam In* and *Beam Out* and investigate these Ed-Blocs.

Students answer questions related to the *Beam* Ed-Blocs.

Students are introduced to the output Ed-Bloc *Light* and investigate this Ed-Bloc.

Students answer questions related to the *Light* Ed-Bloc

Students investigate the design challenge – Monitoring a doorway

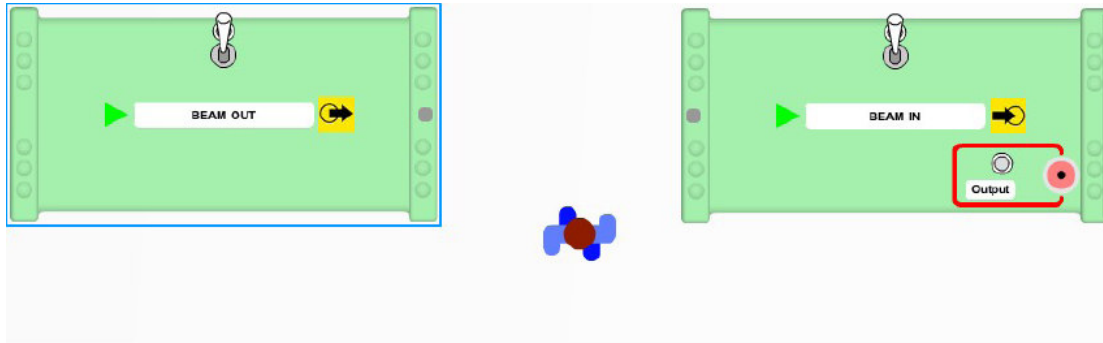
Students answer questions related to the design challenge.



## Lesson

### Beam Ed-Blocs

Introduce the two *Beam* Ed-Blocs. *Beam* Ed-Blocs are input Ed-Blocs that begin a system. These Ed-Blocs need to be aligned so that the arrows point at each other. You will need to position Ed-Blocs 1 to 2 metres apart. Once these are aligned you can break the beam and activate it.




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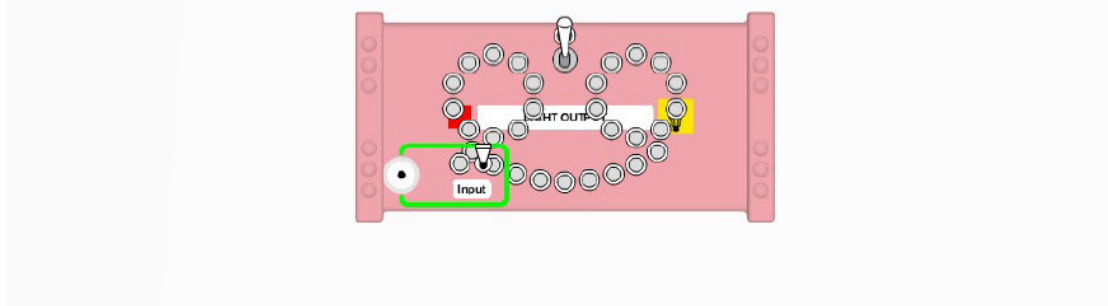
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### Beam Ed-Bloc student questions

1. Does the Beam In and Out Ed-Blocs need to be aligned? **Yes**
2. What are the symbols for the Beam In and Out Ed-Blocs?  and 
3. What colour is the output socket? **a)red**, b) black, c) white, d)blue
4. How far apart should the Beam In/Out Ed-Blocs be positioned to function correctly? **a) 1-2 metres**, b) 3-4 metres, c) 4-5 metres
5. What colour is the base of this input Ed Bloc? a) red **b) green** c) blue
6. The beam between the Beam Ed-Blocs you can not see it as it is at a frequency outside the range of the human eye. Therefore it is invisible. a)False, or **b)True**

### Light Ed-Bloc

Introduce the *Light* Ed-Bloc. The *Light* Ed-Bloc is an output Ed-Bloc. It is placed at the end of a system. When the input is activated the unit will put on a light show.







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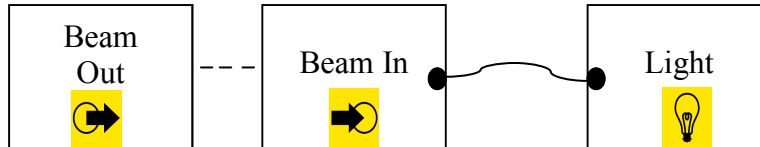
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### Light Ed-Bloc student questions

1. What will the Light Ed-Bloc do when activated? The Ed-Bloc will produce a a) sound, **b) light**, c) vibration
2. Does the light stay on? a) yes, **b) no**
3. What is the colour of the input socket? a)red, b) black, **c) white**, d)blue
4. What is the symbol for the Light Ed-Bloc? a)  **b)**  c) 
5. Is the light Ed-Bloc an input or output Ed-Bloc? **output**
6. What colour is the base of this output Ed Bloc? **a) red**, b) green, c) blue

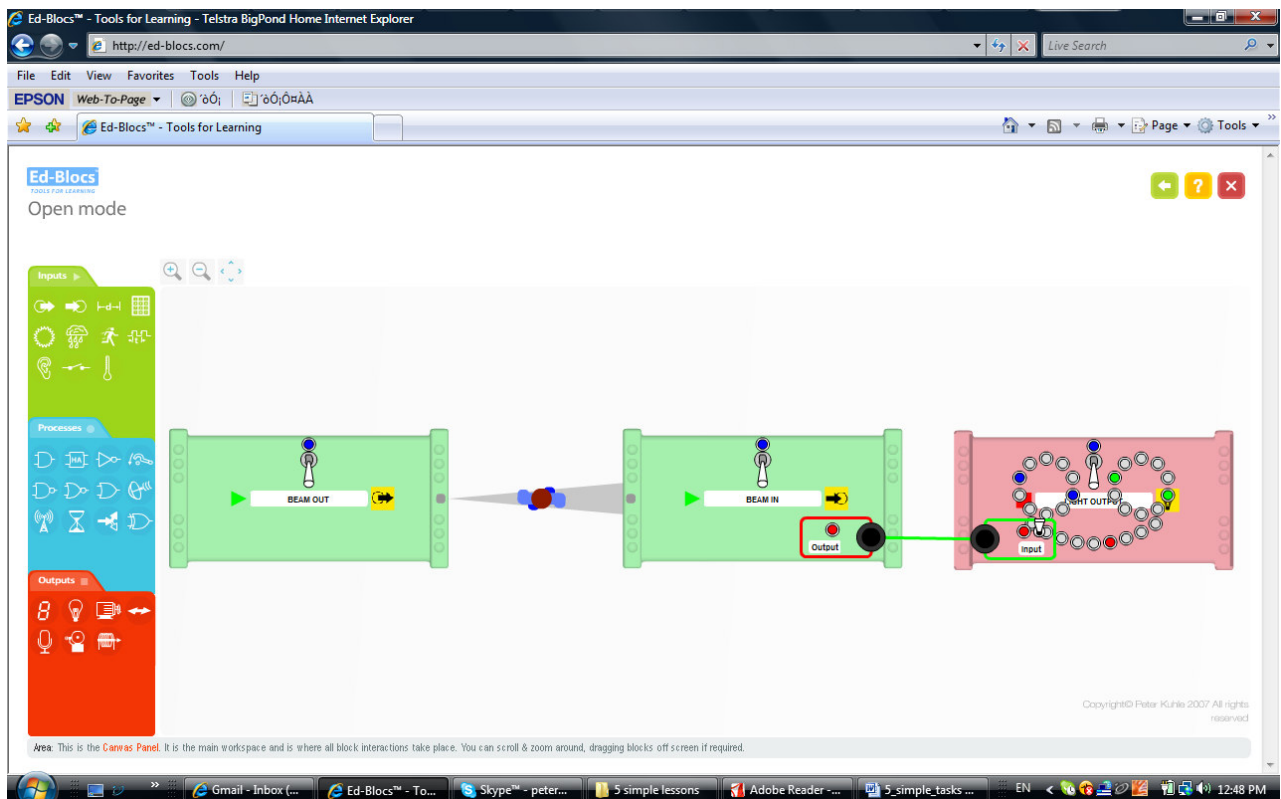
## Design Challenge: To monitor a doorway.

Ask students to design a system that monitors a doorway.



### Design Challenge questions

- 1 Describe in your own words, how this design works. **You break the beam the light comes on.**
- 2 What are the advantages of this design? **Invisible beam.**
- 3 What are the disadvantages of this design? **Needs power to work.**
- 4 Which example could this design detect? **a) cat flap, b) light switch, c).telephone ringing.**



## **Lesson 2 – Make the light stay on.**

### **Outcomes**

TP 3.1, 4.1, 5.1

Students are taught the unique function and identifying symbols of the process Ed-Bloc – *Latch*. Students are to investigate this Ed-Bloc and confirm its function. Students will continue to explore the Beam and Light Ed-Blocs.

TP 3.3, 4.3, 5.3

Students are to incorporate the Ed-Blocs into a design challenge they have been set. They are then to test their design and if wrong, investigate, fix and record why. Students must answer questions related to the Ed-Blocs and the design challenge.

### **Overview**

*Please use the “Suggested dot points for teachers” sheet for ways in which to introduce and allow students to investigate selected Ed-Blocs.*

Students are introduced to the process Ed-Bloc - *Latch* and investigate this Ed-Bloc.

Students answer questions related to the *Latch* Ed-Bloc

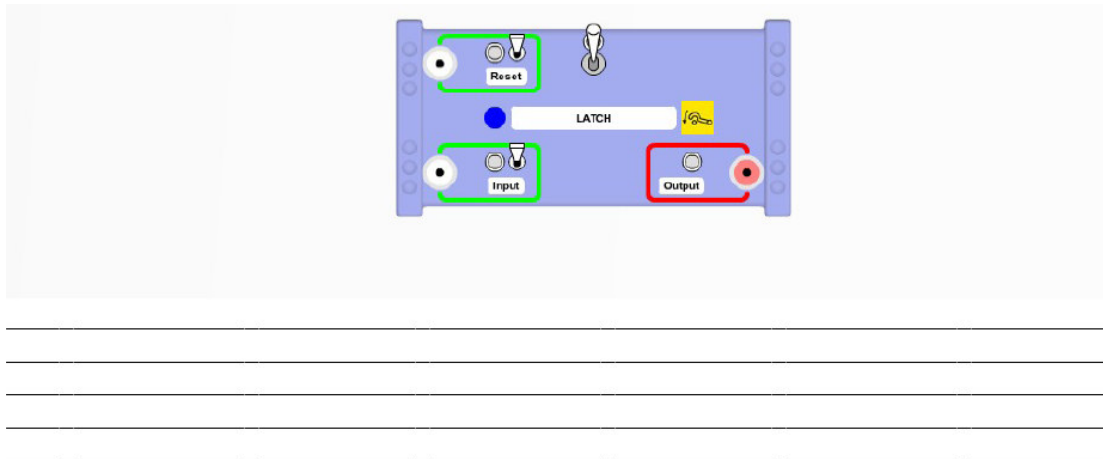
Students investigate the design challenge – How would you know that the door was opened if you were not present?

Students answer questions related to the design challenge.




## Lesson

### Latch Ed-Bloc

Introduce the *Latch* Ed-Bloc. The *Latch* Ed-Bloc is a process Ed-Bloc that is in the middle of a system. The *Latch* Ed-Bloc allows your design to capture and hold an event. When you activate the white input the red output stays activated, even though the input may no longer be activated. You reset it by pressing a switch on the unit or via a white reset input.



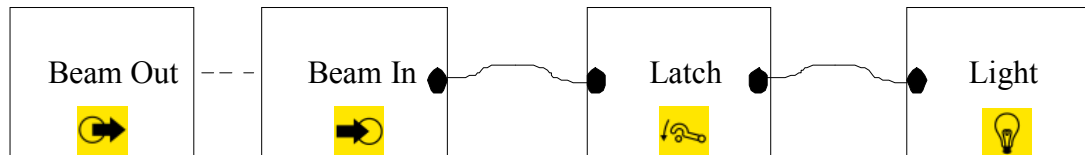
### Latch Ed-Bloc student questions

1. What colour is the input socket? a) red, b) black, c) **white**, d) blue
2. What colour is the output socket? a) **red**, b) black, c) white, d) blue
3. What is the symbol for the Latch Ed-Bloc? a)  b)  c) 
4. What is the function of the Latch Ed-Bloc? a) **When the input is activated the output stays activated**, b) When the input is activated the output deactivates
5. Is the latch Ed-Bloc an input, process or output Ed-Bloc? a) **process**, b) output, c) input
6. Can you reset the latch? a) **yes**, b) no

**Design Challenge: How would you know that someone had walked through your doorway if you were away?**

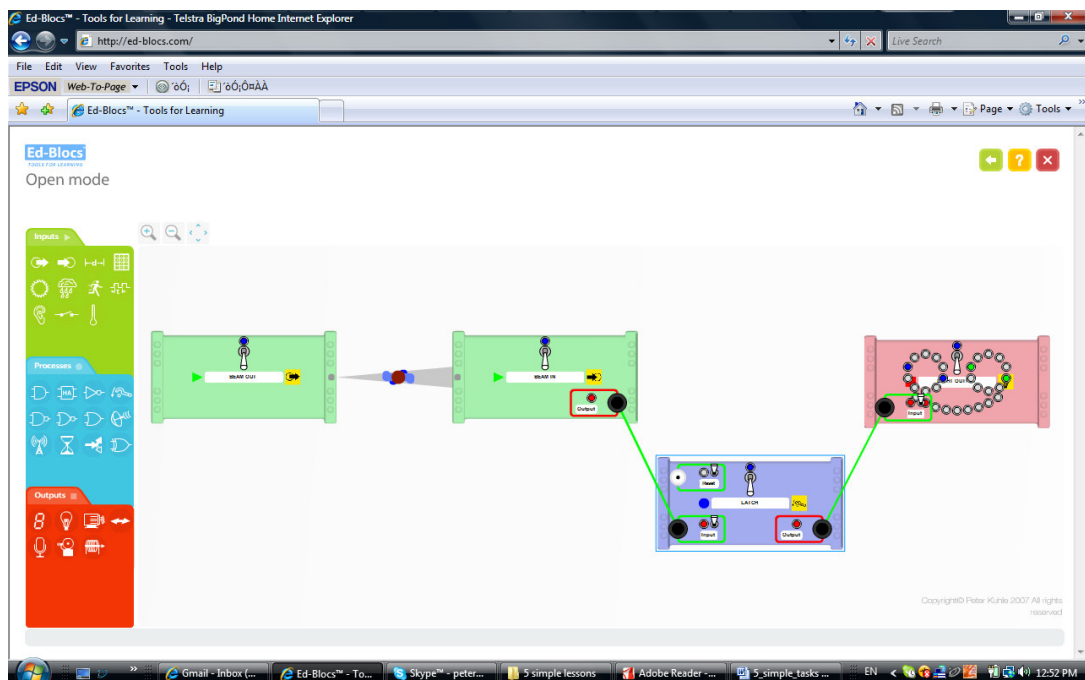
Ask students to design a system that allows them to know that someone had been through the doorway in their absence.

Draw your design. Use the cards to help make up your design.



**Design Challenge questions**

1. Draw and describe how this design works.
2. How many process Ed-Blocs are in your design? a) 0, **b) 1**, c) 2
3. How long does the Light Ed-Bloc stay activated? a) 1 second, **b) indefinitely**, c) for as long as beam is activated, d) never
4. How do we reset the design? a) pull design apart and put back together, b) turn light off then on, c) turn beam blocs off then on, **d) push reset button on Latch Ed-Bloc**, e) any of the above
5. What are the advantages of this design?
6. What are the disadvantages of this design?
7. If you completed this design challenge in a group – what challenges did you face?





### **Lesson 3 – Monitor an object.**

#### **Outcomes**

TP 3.1, 4.1, 5.1

Students are taught the unique function and identifying symbols of the process Ed-Bloc –*Inverter*. Students are to investigate this Ed-Bloc and confirm its function. Students will continue to explore the Beam and Light Ed-Blocs.

TP 3.3, 4.3, 5.3

Students are to incorporate the Ed-Blocs into a design challenge they have been set. They are then to test their design and if wrong, investigate, fix and record why. Students must answer questions related to the Ed-Blocs and the design challenge.

#### **Overview**

*Please use the “Suggested dot points for teachers” sheet for ways in which to introduce and allow students to investigate selected Ed-Blocs.*

Students are introduced to the process Ed-Bloc *Inverter* and investigate this Ed-Bloc.

Students answer questions related to the *Inverter* Ed-Bloc

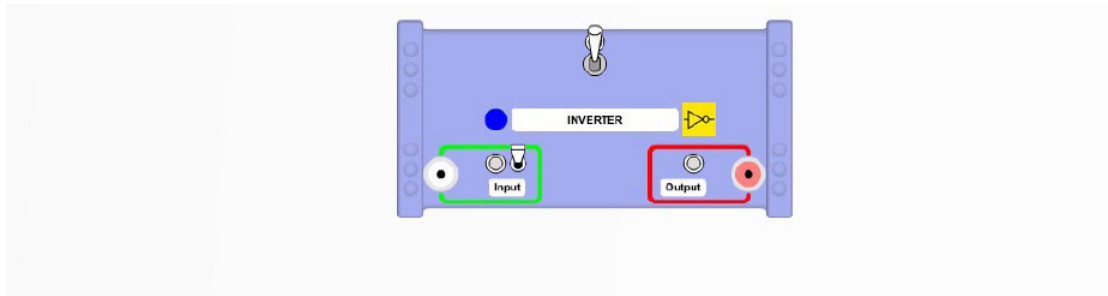
Students investigate the design challenge – *Monitor an object*.

Students answer questions related to the design challenge.




## Lesson

### Inverter Ed-Bloc

Introduce the *Inverter* Ed-Bloc. The *Inverter* Ed-Bloc is a process Ed-Bloc that is in the middle of a system. The output is always **opposite** to the input. This allows the logic of a design to change to the opposite state.

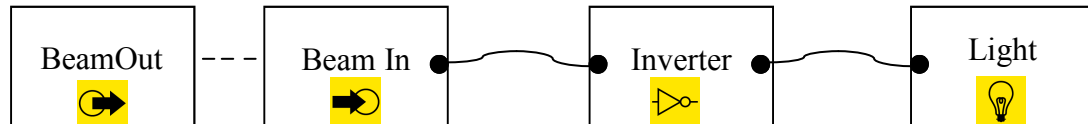


### Inverter Ed-Bloc student questions

1. What colour is the output socket? a) red, b) black, c) white, d) blue
2. What colour is the input socket? a) red, b) black, c) white, d) blue
3. What is the symbol for the Inverter Ed-Bloc? a)  b)  c) 
4. What colour is the base of this process Ed-Bloc a) red b) green c) blue
5. What is the function of the Inverter Ed-Bloc? a) output is always opposite to the input, b) the output is the same as the input, c) the output is occasionally opposite to the input.
6. Is the Inverter Ed-Bloc an input, process or output Ed-Bloc? a) process, b) output, c) input

**Design Challenge: To monitor an object.**

Ask students to design a system that monitors an object.



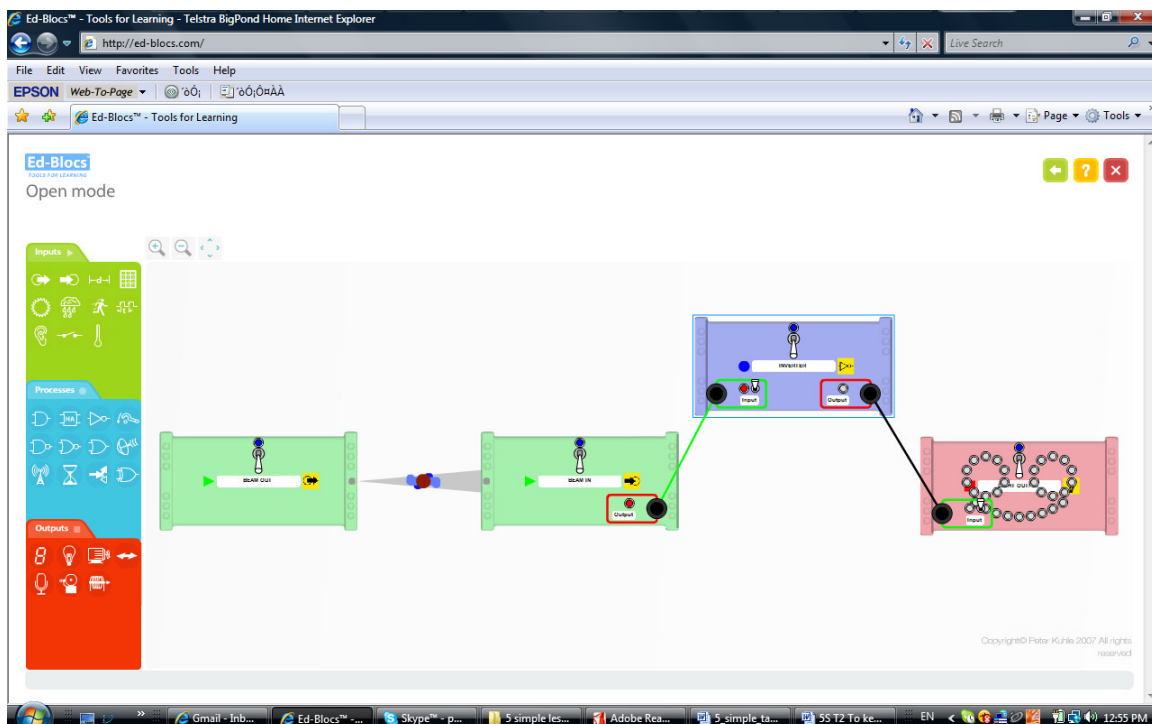
**Design Challenge questions**

1. Describe how this design works.
2. Does the light stay on? a) yes, b) no
3. What are the advantages of this design?
4. What are the disadvantages of this design?
5. Which of the following is this design most appropriate for? a) museum, b) jewellery store, c) bakery, d) a & b

- Teacher models to the students how to draw a design on paper.

Allow children to copy/draw the design.

Now allow children to have a go at drawing the first design on their own.



## Lesson 4 – To make a siren stay on.

### Outcomes

TP 3.1, 4.1, 5.1

Students are taught the unique function and identifying symbols of the input Ed-Bloc – *Sound* and the output Ed-Bloc – *Siren*. Students are to investigate Ed-Blocs and confirm their function.

TP 3.3, 4.3, 5.3

Students are to incorporate the Ed-Blocs into a design challenge they have been set. They are then to test their design and if wrong, investigate, fix and record why. Students must answer questions related to the Ed-Blocs and the design challenge.

SYS 3.1, 4.1, 5.1

Students are to identify and explain the logic of the systems they are creating using the terms input, process and output.

INF 3.2, 4.2, 5.2

Students identify the advantages and disadvantages of particular systems and use this information to affect their design.

### Overview

Please use the “Suggested dot points for teachers” sheet for ways in which to introduce and allow students to investigate selected Ed-Blocs.

Students are introduced to the input Ed-Bloc – *Sound sensor* and investigate this Ed-Bloc.

Students answer questions related to the *Sound sensor* Ed-Bloc.

Students are introduced to the output Ed-Bloc - *Siren* and investigate this Ed-Bloc.

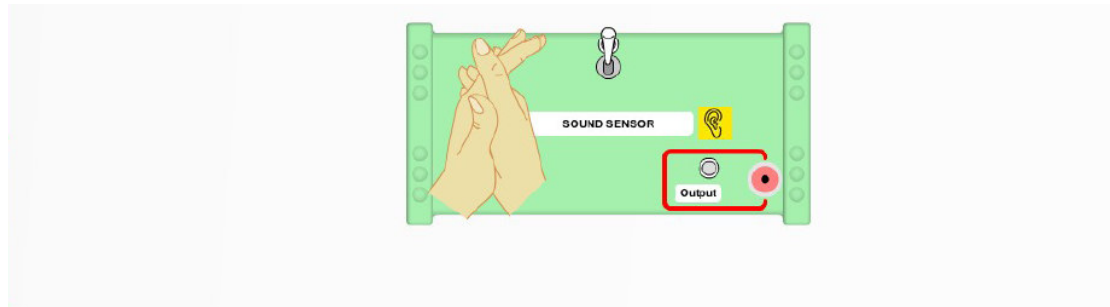
Students answer questions related to the *Siren* Ed-Bloc.

Students answer questions related to the design challenge.

## Lesson

### Sound sensor Ed-Bloc

Introduce the *Sound* sensor Ed-Bloc. The *Sound* sensor Ed-Bloc is an input Ed-Bloc that is at the start of a system. This Ed-Bloc has a microphone mounted in the unit. The unit is activated when ever it detects a sound above a certain level.




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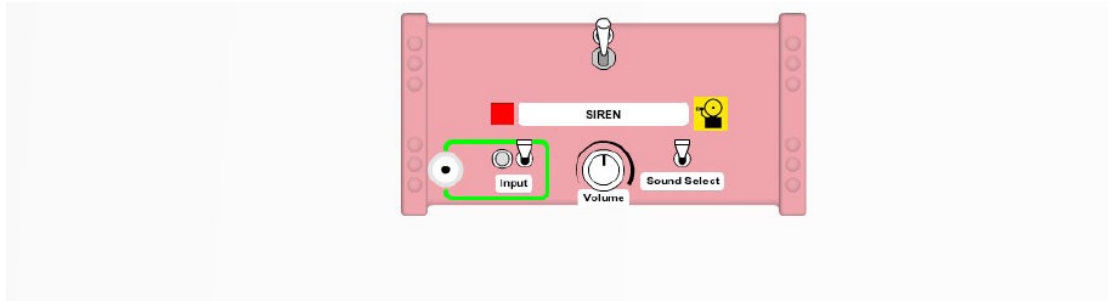
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### Sound sensor Ed-Bloc student questions

1. What is the symbol for the Sound sensor Ed-Bloc? a)  b)  c) 
2. What does the Sound sensor Ed-Bloc detect? a) movement, b) light, c) **sound**, d) heat
3. How long is the Sound sensor Ed-Bloc activated for? a) **short period** b) long period c) indefinitely d) never
4. Is the Sound sensor Ed-Bloc an input, process or output Ed-Bloc? a) process, b) output, c) **input**
5. Which sound would activate this Ed-Bloc? a) a whisper b) **clapping** c) birds chirping

### Siren Ed-Bloc

Introduce the *Siren* Ed-Bloc. The *Siren* Ed-Bloc is an output Ed-Bloc that is at the end of a system. While the input is activated the unit produces selectable alert sounds.






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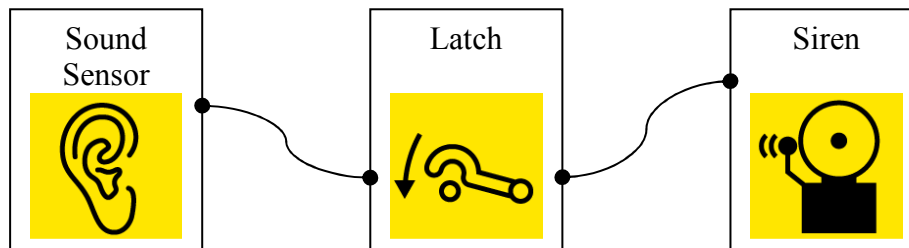
### Siren Ed-Bloc student questions

1. What is the symbol for the Siren Ed-Bloc? a)  b)  c) 
2. Is the Siren Ed-Bloc an input, process or output Ed-Bloc? a) process, b) **output**, c) input
3. When is the alert sounded? a) while the output is activated, b) **while the input is activated**
4. How long does the alert stay on? a) **as long as the input is activated**, b) forever, c) a short period of time.
5. How many different sounds does the siren make? a) 1 b) 2 c) **3** d) 4



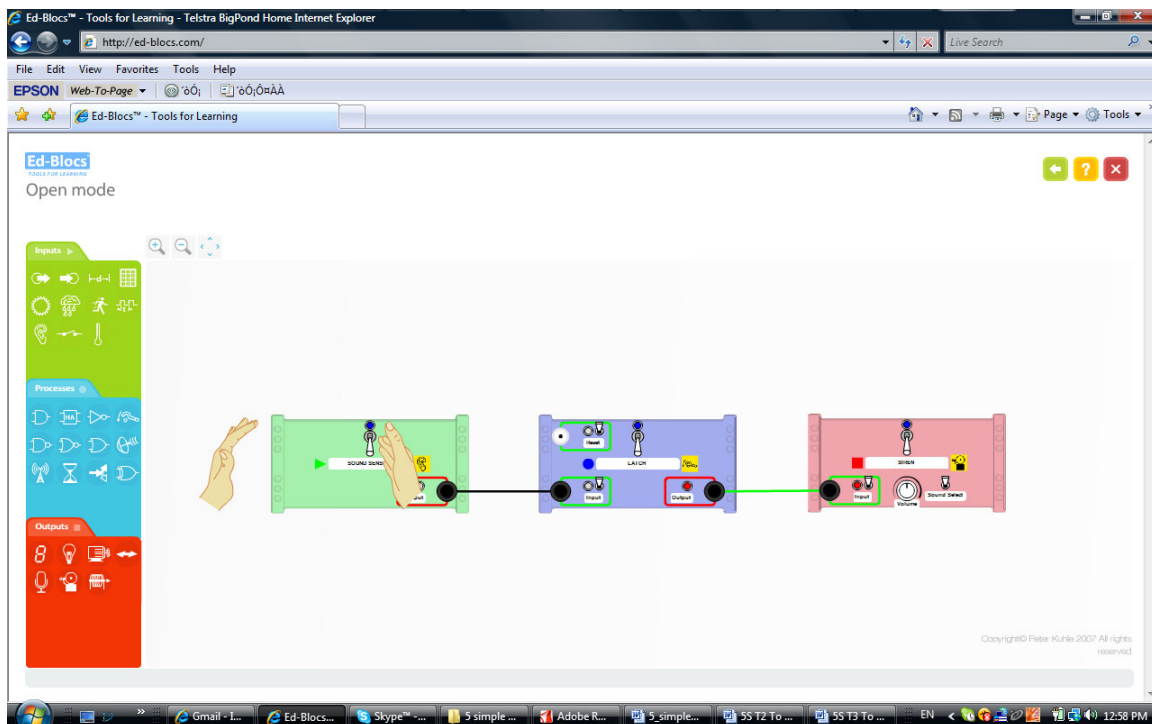
**Design Challenge: To activate the siren and make it stay on.**

Draw your design. Use the cards to help make up your design.



### Design Challenge questions

1. Draw and describe how your design works.
2. What are the advantages of this design?
3. What are the disadvantages of this design?
4. How long does the siren stay on? a) short period b) long period c) indefinitely d) never
5. How can we stop the Siren Ed-Bloc in the design? a) reset the Sound sensor b) reset the Latch c) reset the Siren
6. What is the Latch Ed-Bloc doing in this design? Captures the event and holds it. If you have the hardware – connect the siren straight to the sound sensor without the latch. Point sound from siren towards sound sensor and clap your hands. This is audio feedback.
7. How will the latch and siren affect the neighbours?
8. How is the sound level appropriate? Why or why not?



## **Lesson 5 – Siren on for only a few seconds.**

### **Outcomes**

TP 3.1, 4.1, 5.1

Students are taught the unique function and identifying symbols of the process Ed-Bloc – Timer. Students are to investigate this Ed-Bloc and confirm its function. Students will continue to explore the Sound and Siren Ed-Blocs.

TP 3.3, 4.3, 5.3

Students are to incorporate the Ed-Blocs into a design challenge they have been set. They are then to test their design and if wrong, investigate, fix and record why. Students must answer questions related to the Ed-Blocs and the design challenge.

### **Overview**

*Please use the “Suggested dot points for teachers” sheet for ways in which to introduce and allow students to investigate selected Ed-Blocs.*

Students are introduced to the process Ed-Bloc - *Timer* and investigate this Ed-Bloc.

Students answer questions related to the *Timer* Ed-Bloc

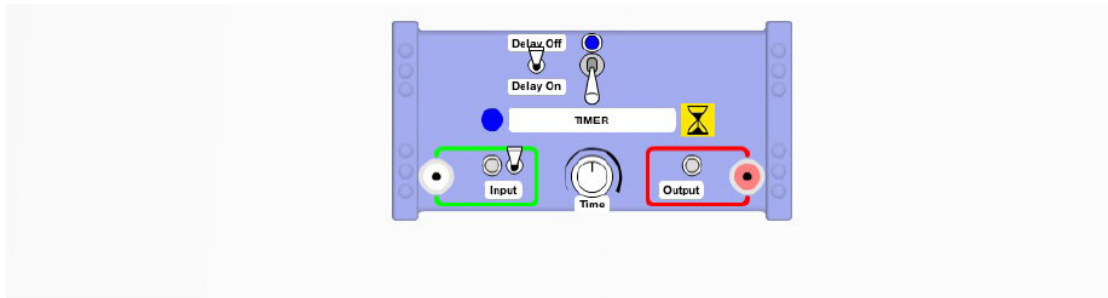
Students investigate the design challenge – To create a system where the siren is on for only a few seconds. Student replace the Latch Ed-Bloc with a new Ed-Bloc called the Timer. Using this process bloc instead of the Latch Ed-Bloc their system will be able to deter but not become a neighbourhood nuisance.

Students answer questions related to the design challenge.

## Lesson

### Timer Ed-Bloc

Introduce the *Timer Ed-Bloc*. The *Timer Ed-Bloc* is a process Ed-Bloc that is in the middle of a system. This Ed-Bloc has two different control switches and the power on/off switch. One is a selector switch and can be switched between “delay on” or “delay off”. The other switch is the input switch to activate and start the timing. Note in the design challenge the *Timer Ed-Bloc* will need to be in delay off mode – switch in the up position.




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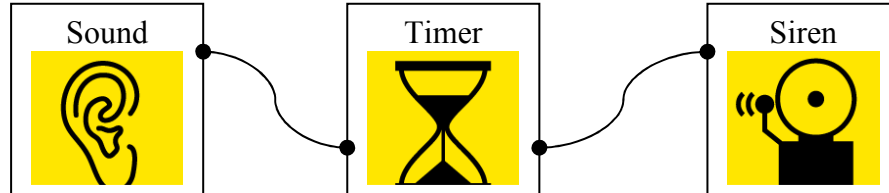
### Timer Ed-Bloc student questions

1. What is the symbol for the Timer Ed-Bloc? a)  b)  c) 
2. What does the delay on function do?
3. What does the adjustable knob do?
4. What does the delay off function do?
5. Why do we need an input and an output socket?

## **Design Challenge: Siren is on for only a few seconds.**

Ask students to design a system that allows the siren to be on for only a brief period.

Draw your design. Use the cards to help make up your design.



### Design Challenge questions

1. Draw and describe how your design works.
2. What are the advantages of this design?
3. What are the disadvantages of this design?
4. Why is it better to use a timer than a latch with a siren?
5. What is an appropriate time to set the timer for? a) hours b) minutes c) **seconds**
6. If you are not present and out of hearing distance would you know that the system had gone off? **No**
7. Is a latch best with a light in an alarm circuit? **Yes for the neighbours.**

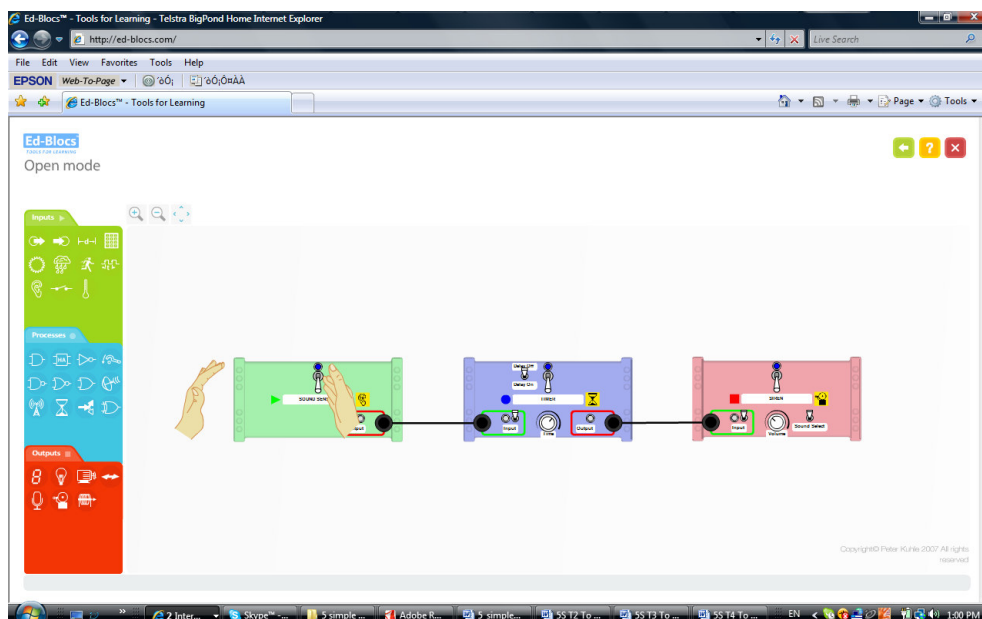
### **Lesson extensions –**

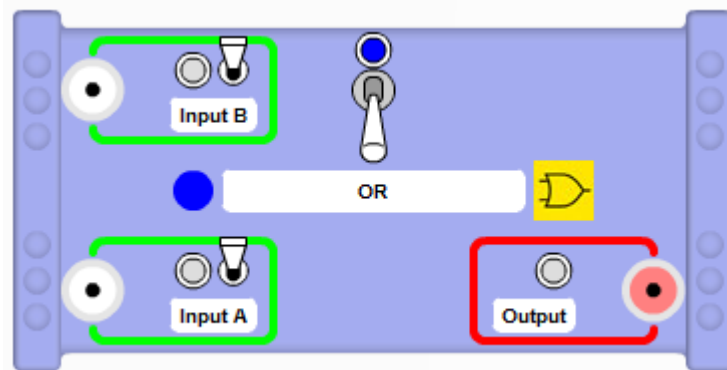
Use the double adaptor to have two circuits coming off a sensor. One circuit for a latch & light and the other circuit for a timer & siren.

Go to website [www.ed-blocs.com](http://www.ed-blocs.com) – login name is “student” and password is “password”, access “Open Mode” and explore the OR gate and connect multiple sensors to it’s inputs (teachers use “teacher” and “password”)

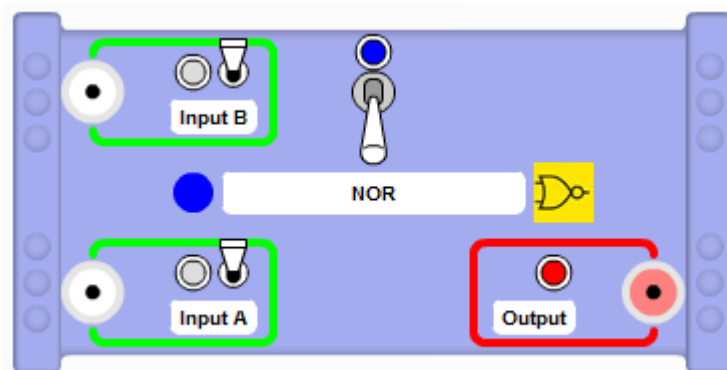
The Veg Patch Activity in the lessons section continues this journey.

Explore the Logic gate functions and the remaining Ed-Blocs to build up your solutions.



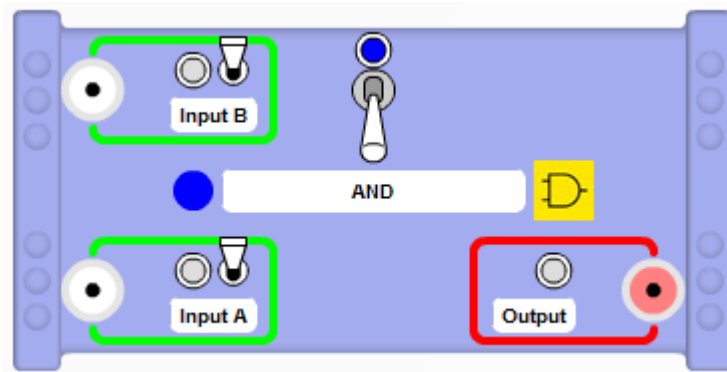


OR	B off	B on
A off		
A on		

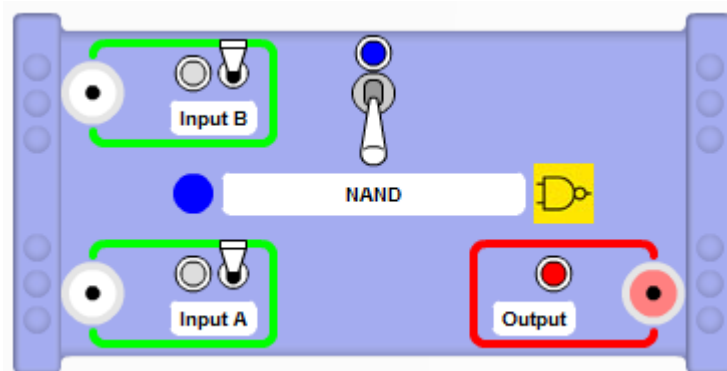


NOR	B off	B on
A off		
A on		

# FIVE SIMPLE LESSONS TEACHER MANUAL



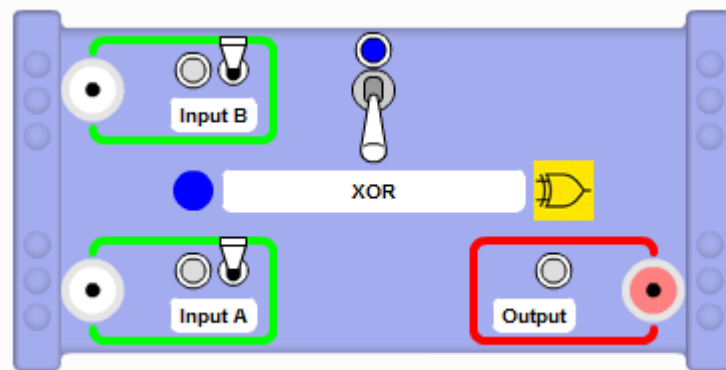
AND	B off	B on
A off		
A on		



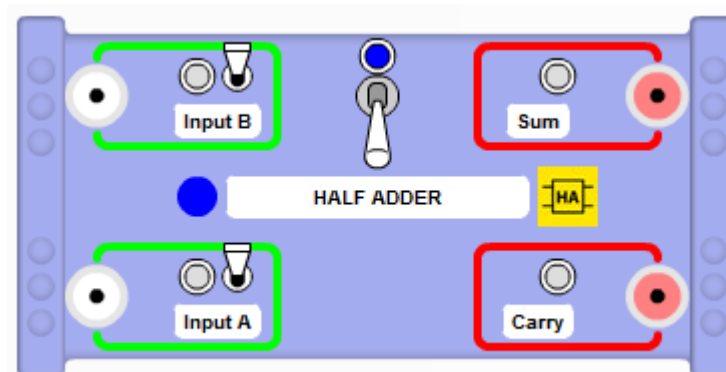
NAND	B off	B on
A off		
A on		



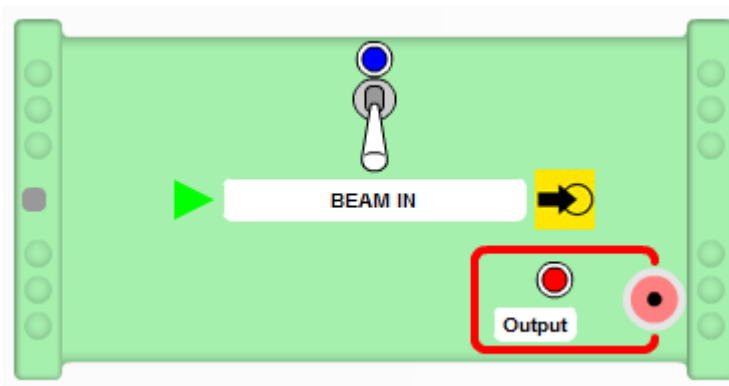
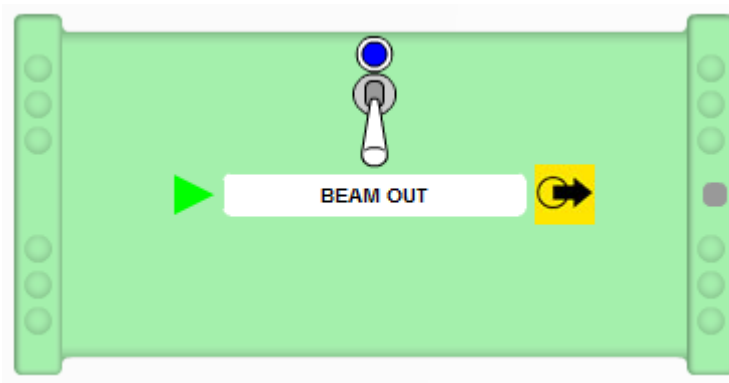
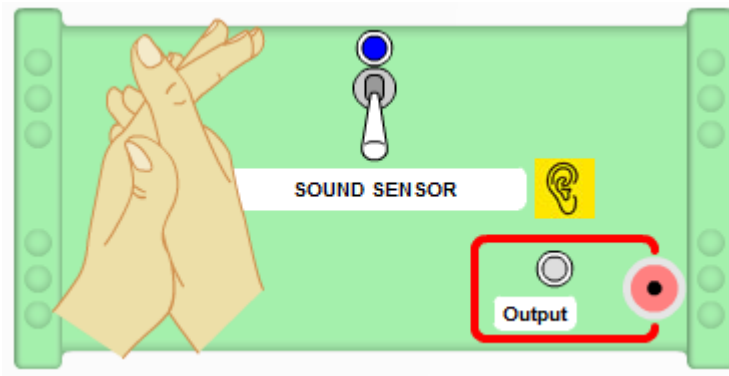
# FIVE SIMPLE LESSONS TEACHER MANUAL

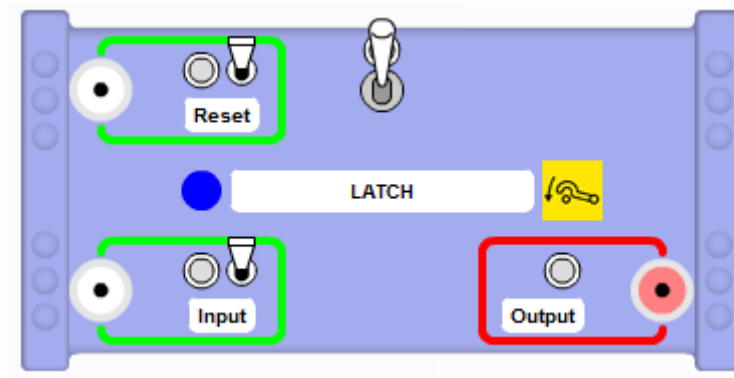


XOR	B off	B on
A off		
A on		



INPUT A	INPUT B	SUM	CARRY
OFF	OFF		
ON	OFF		
OFF	ON		
ON	ON		





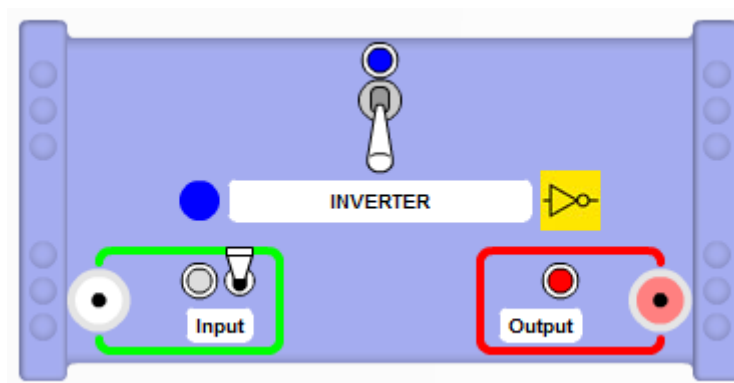

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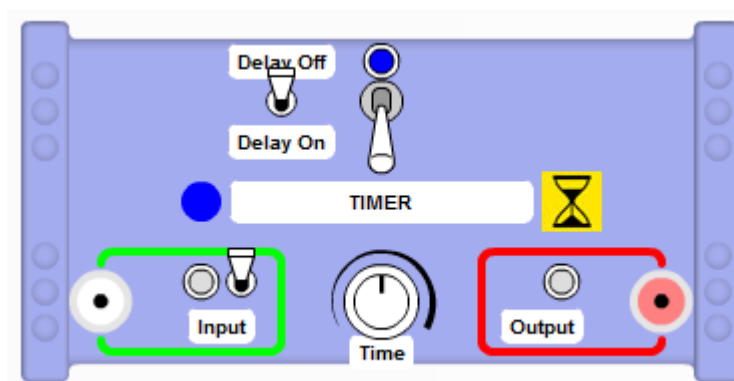

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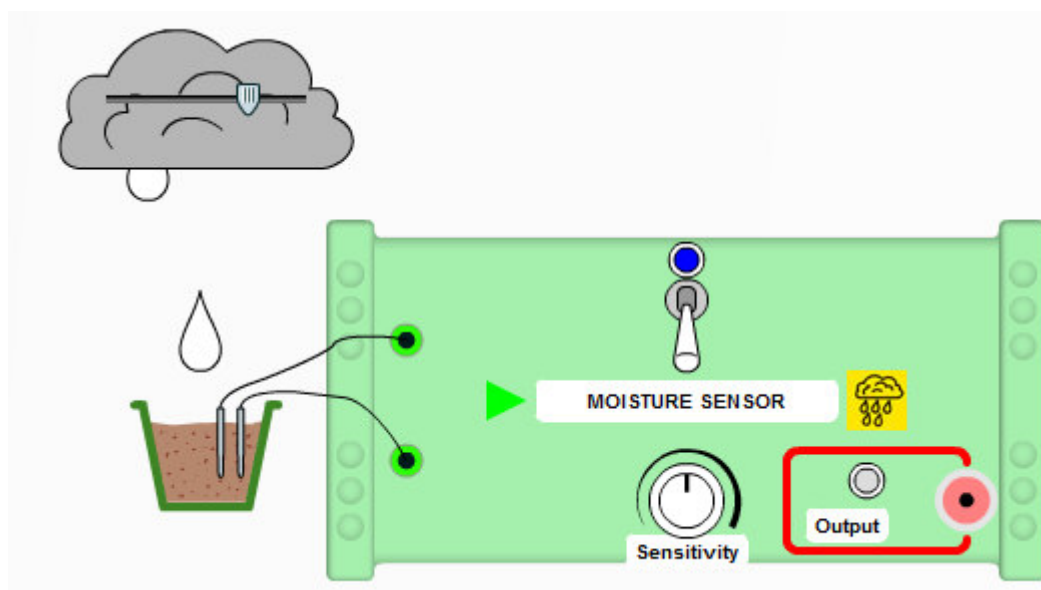
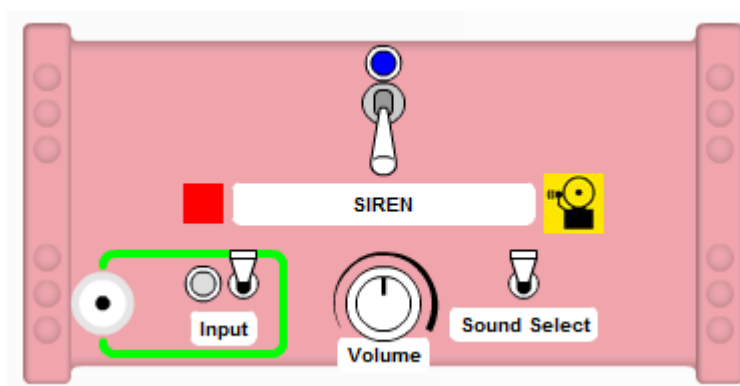
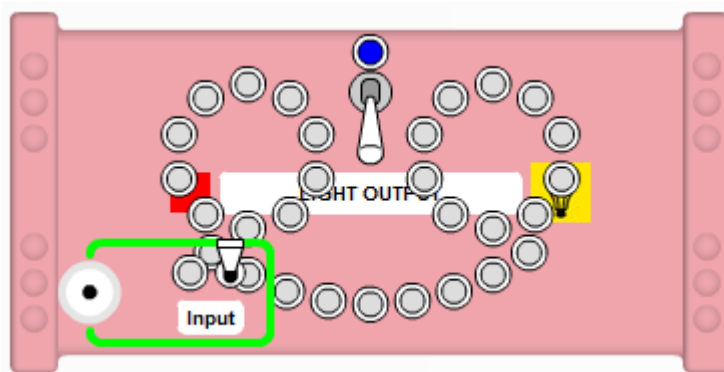

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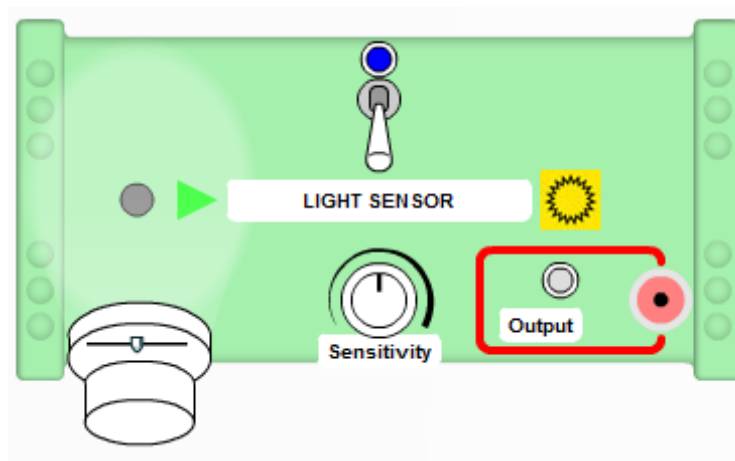


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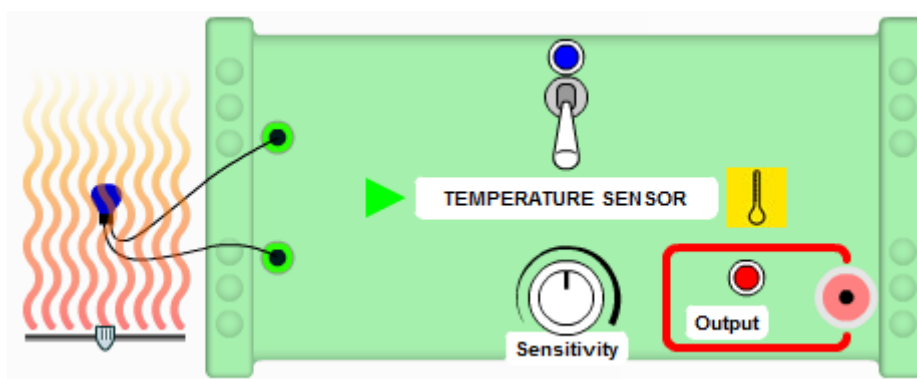

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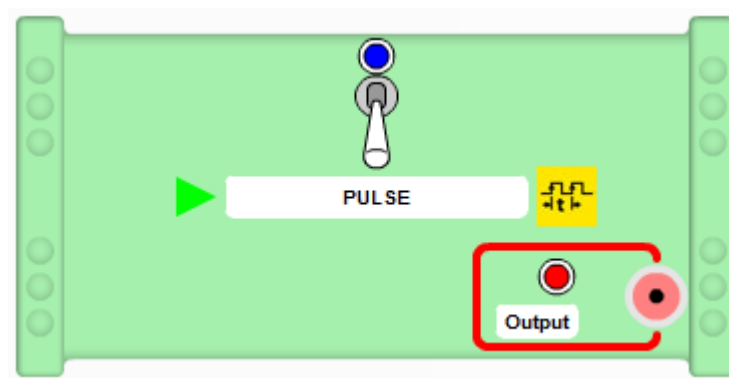

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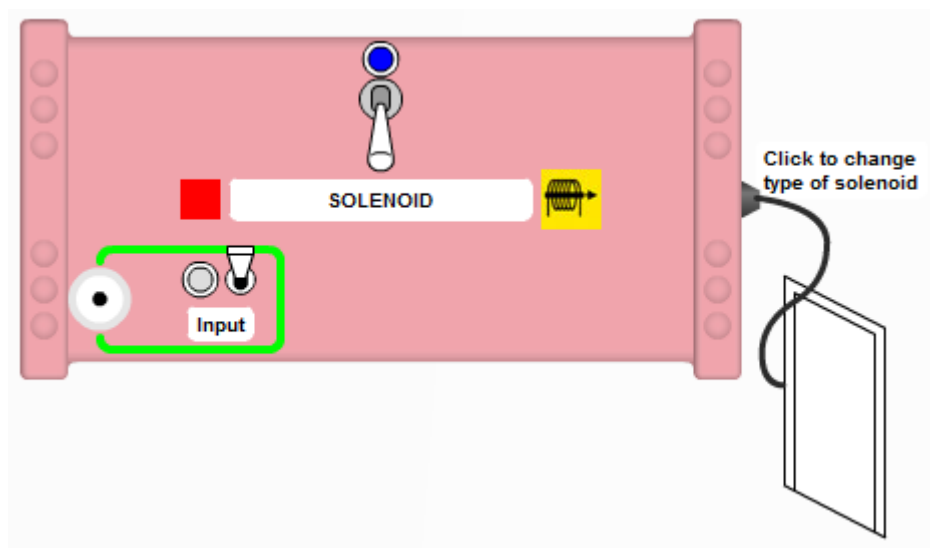
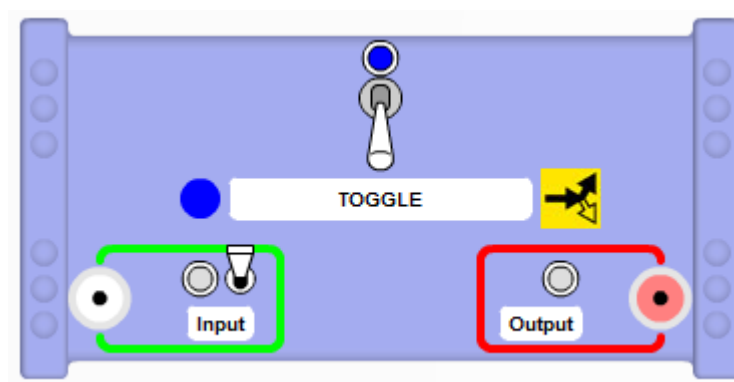

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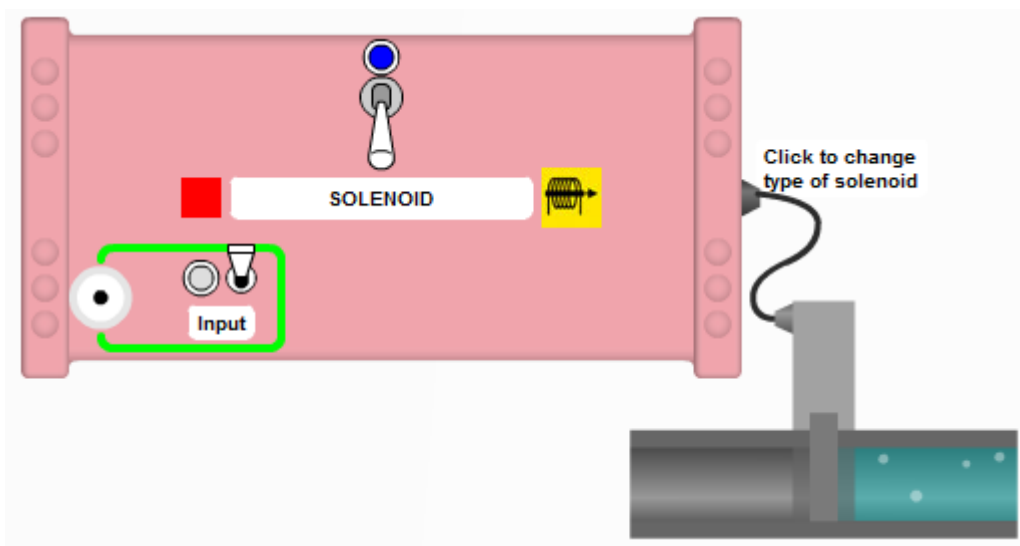
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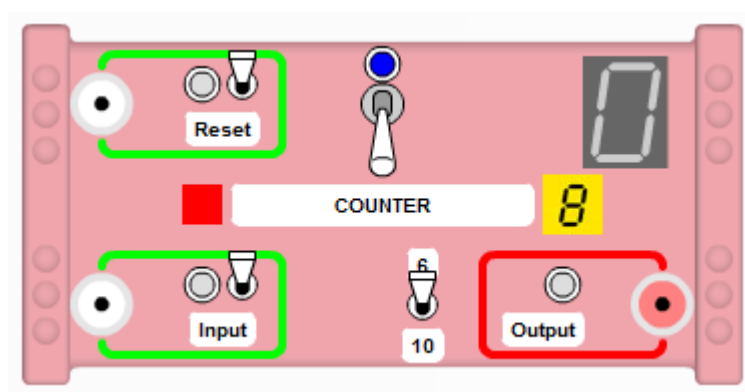

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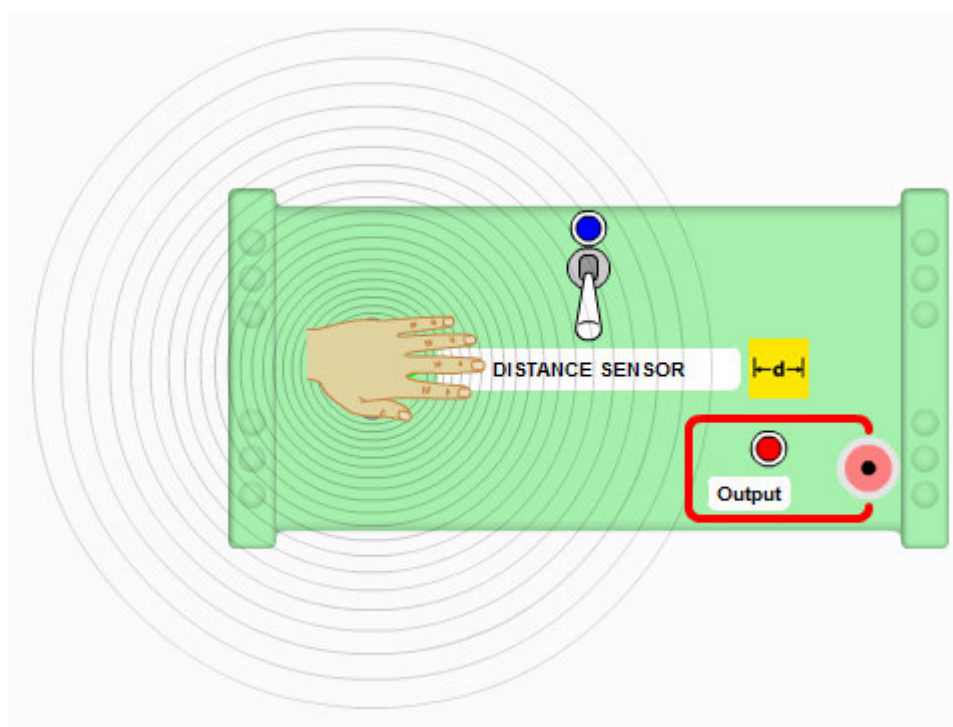
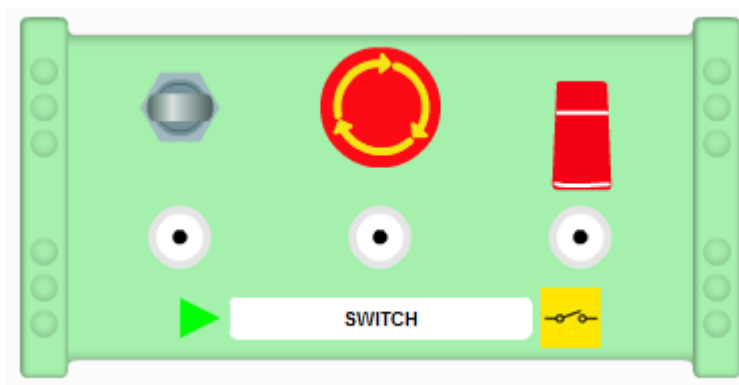

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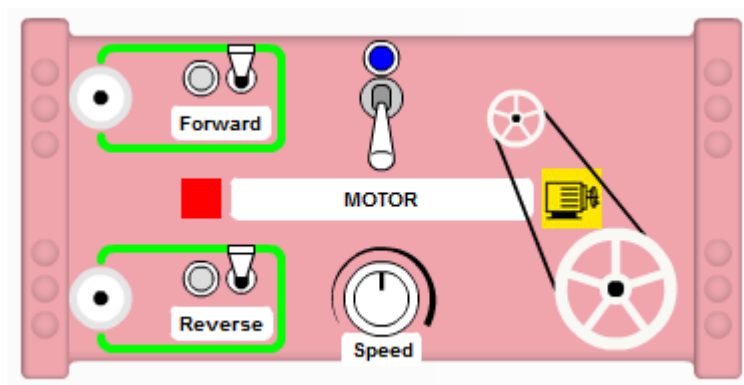
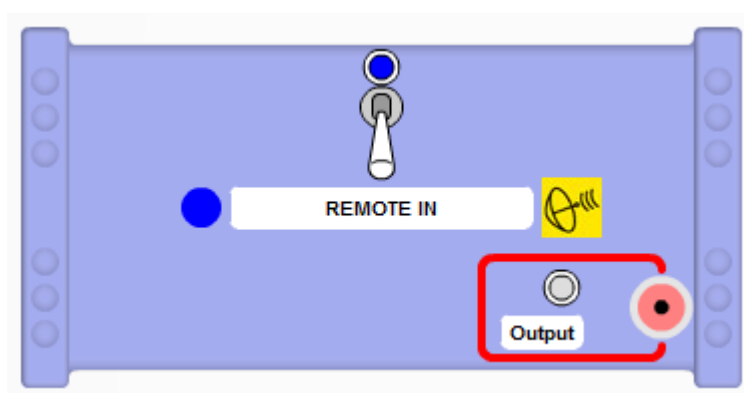
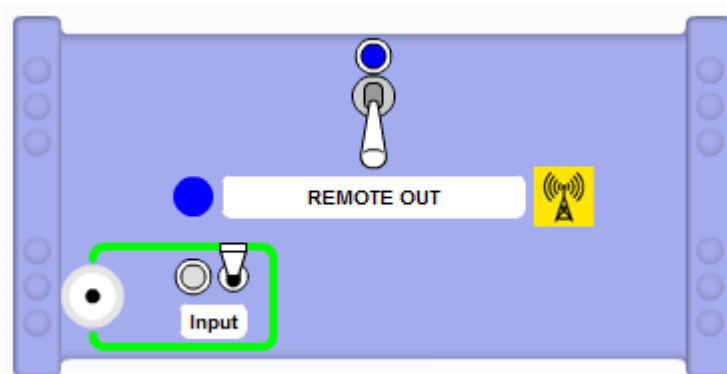


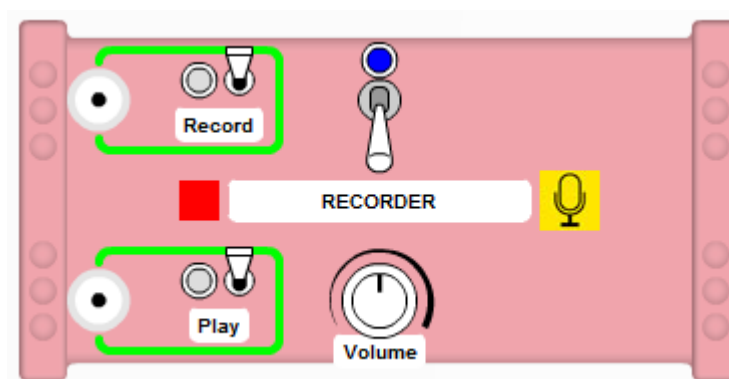
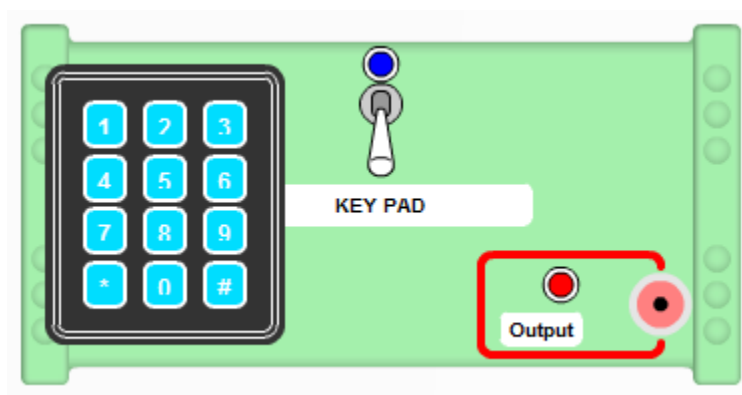
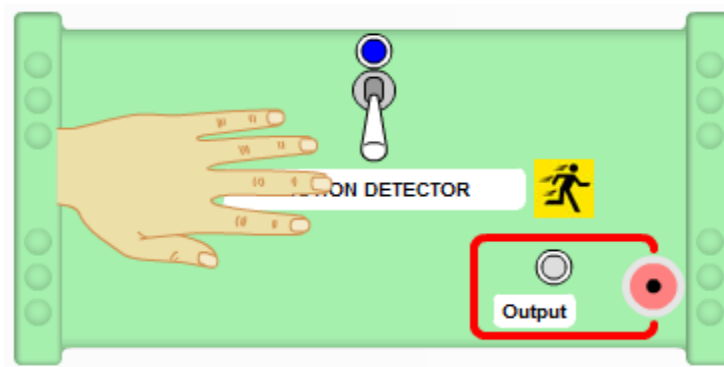
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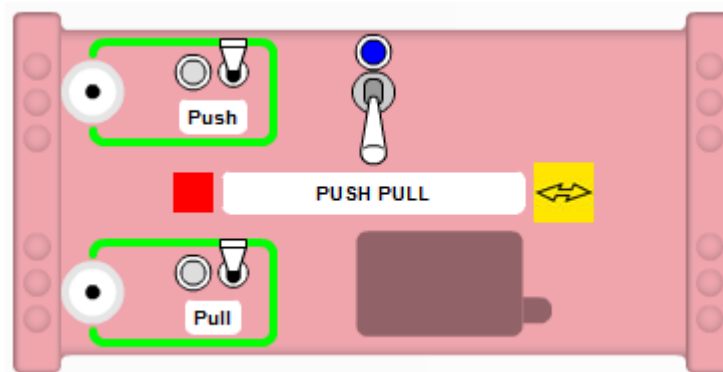


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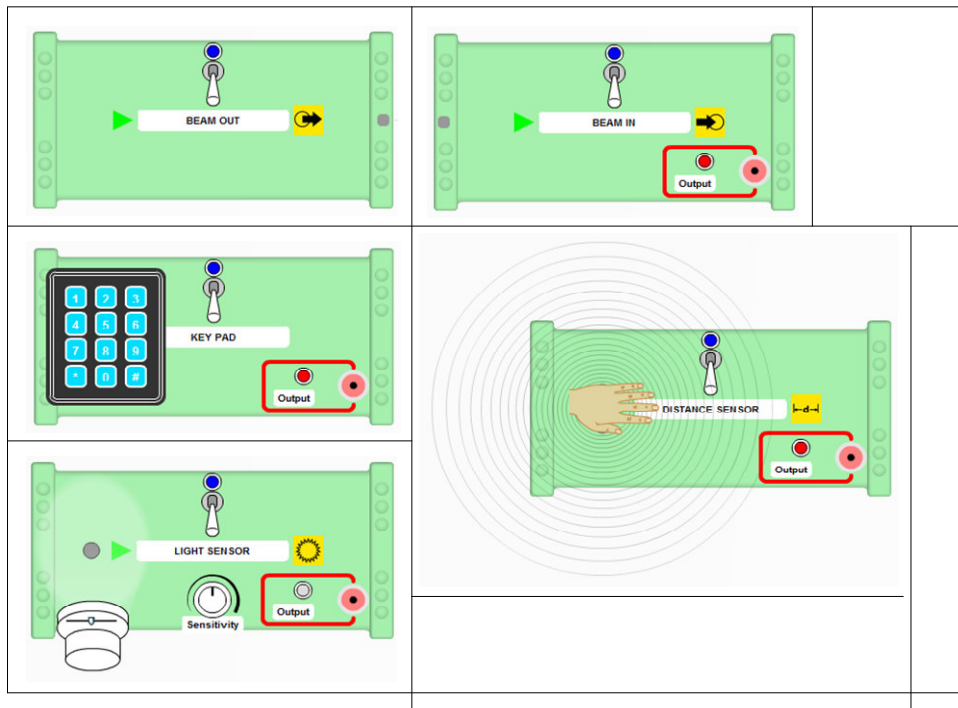


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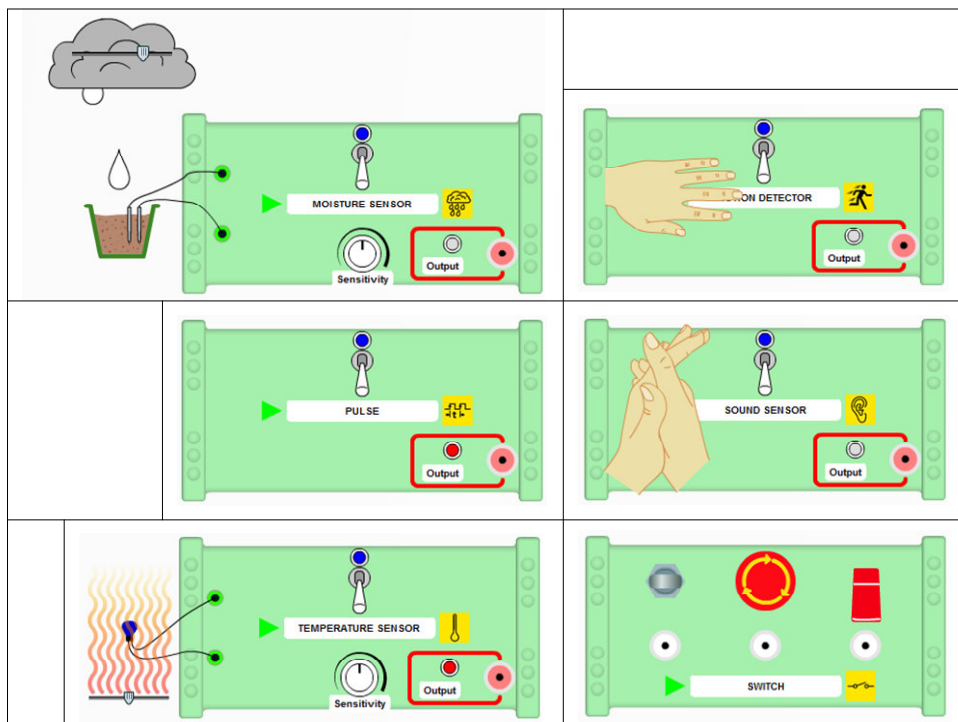
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## FIVE SIMPLE LESSONS TEACHER MANUAL

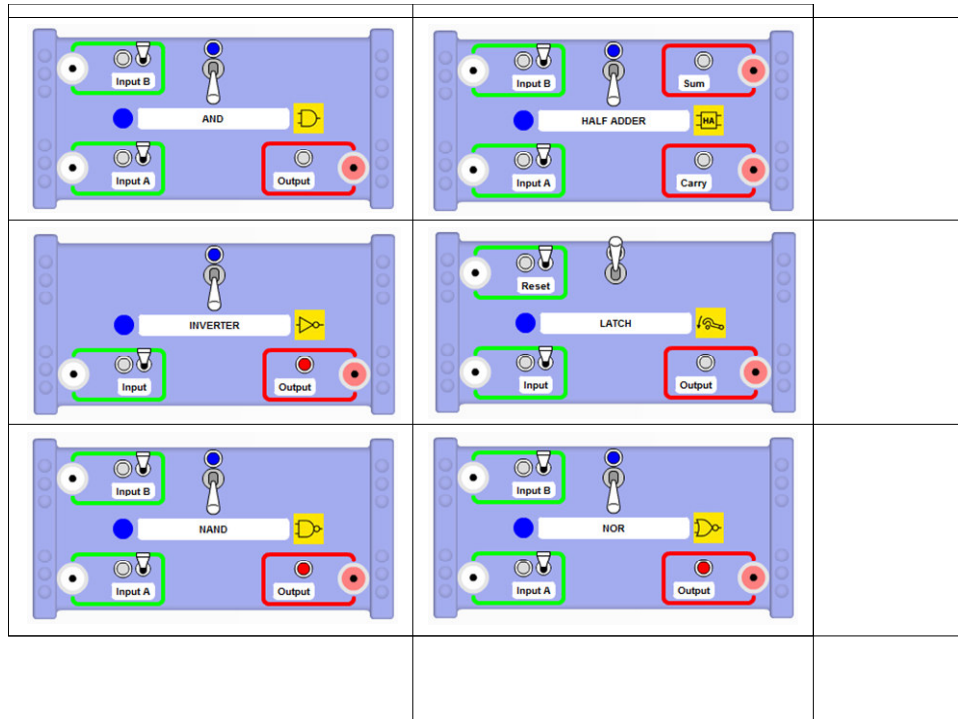


Cut along lines – use to help students hypothesize their design to the teacher.

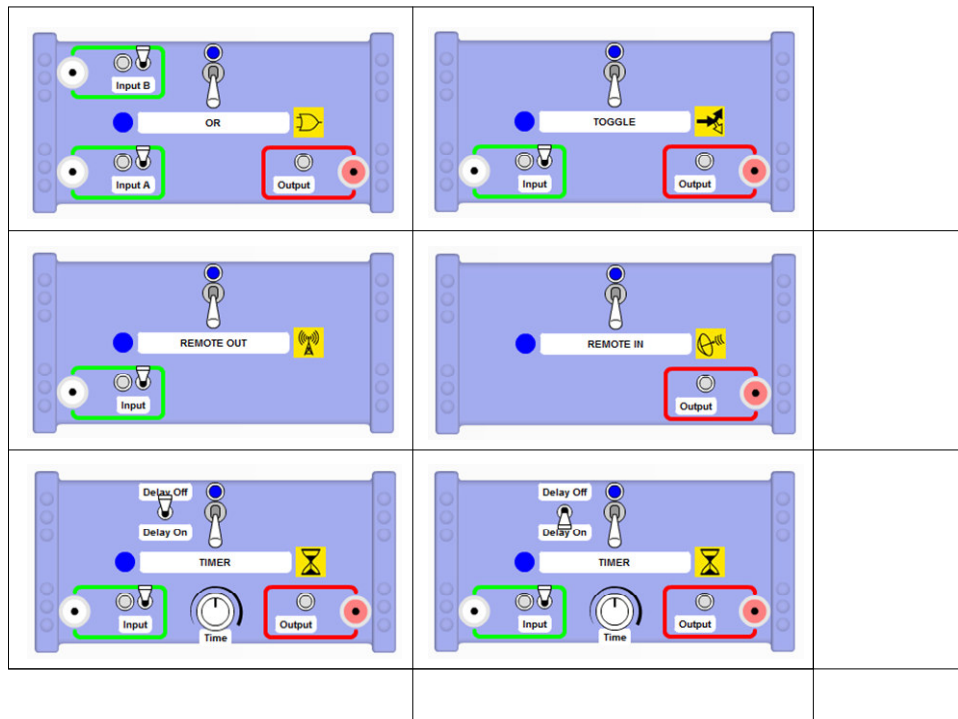


Cut along lines – use to help students hypothesize their design to the teacher.

## FIVE SIMPLE LESSONS TEACHER MANUAL

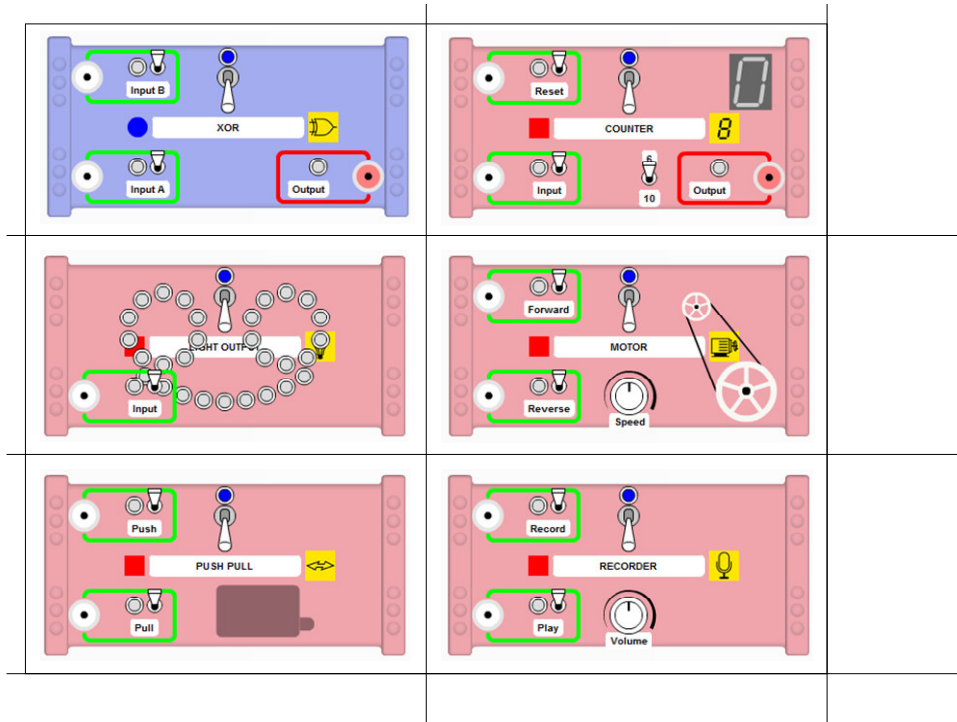


Cut along lines – use to help students hypothesize their design to the teacher.

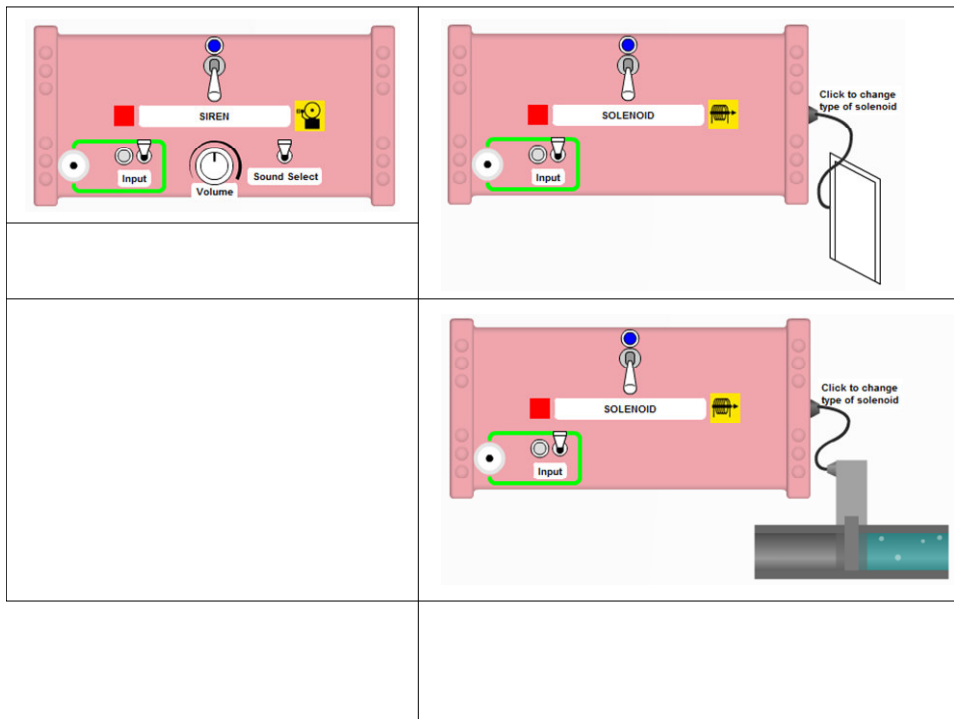


Cut along lines – use to help students hypothesize their design to the teacher.

## FIVE SIMPLE LESSONS TEACHER MANUAL



Cut along lines – use to help students hypothesis their design to the teacher.



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