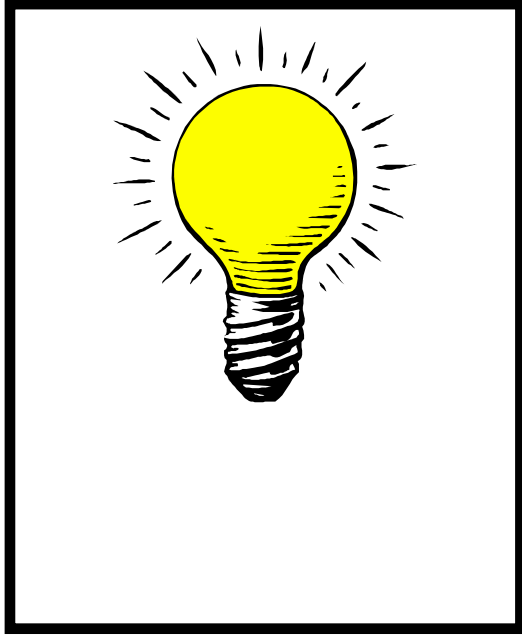
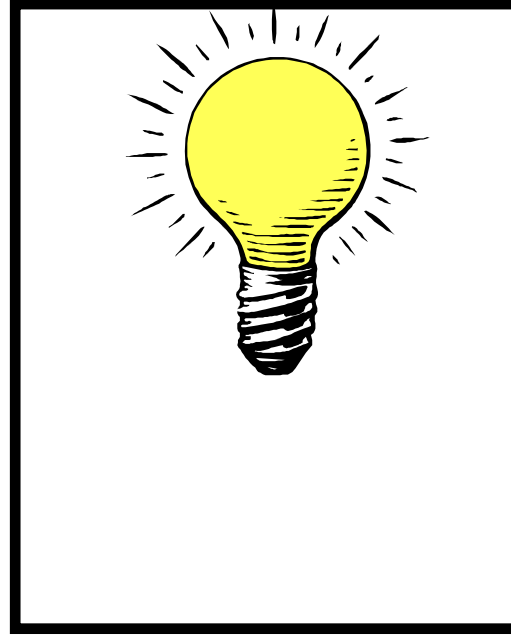


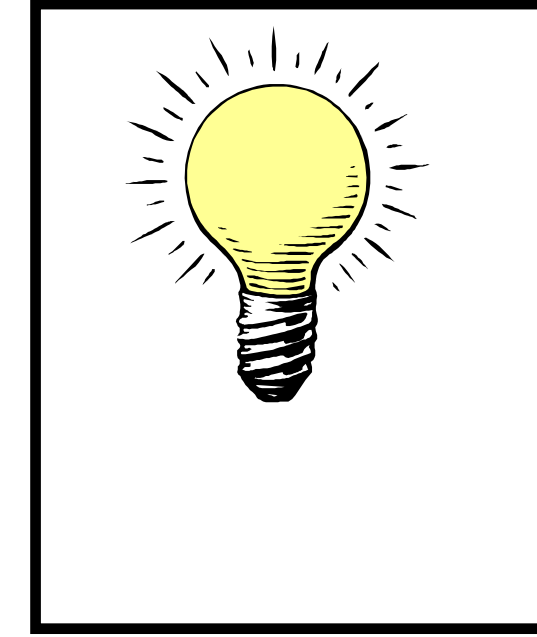
# The Bulbs - Investigations of Series and Parallel Circuits



The bulbs get brighter

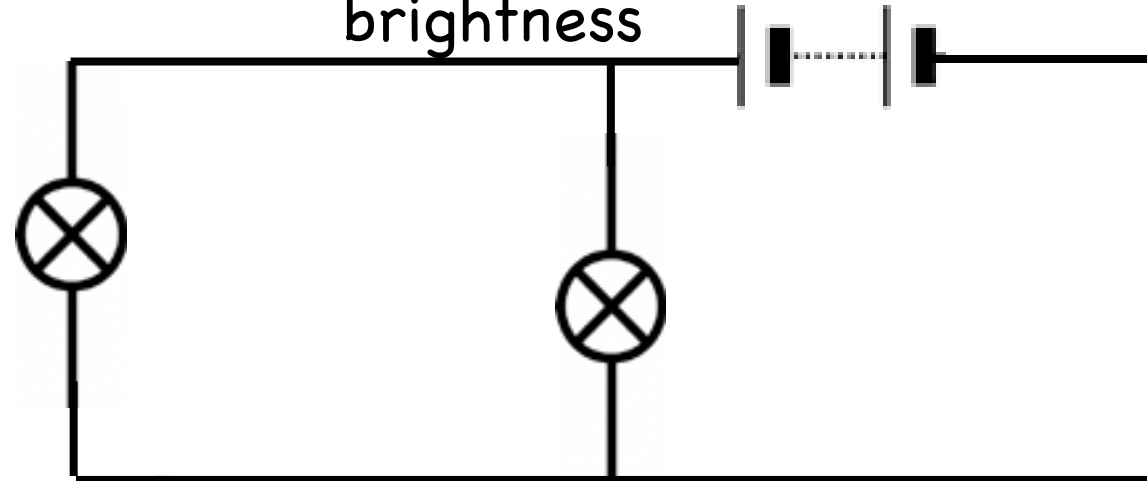


The bulbs stay the same brightness



The bulbs get dimmer

A parallel circuit



# The Bulbs - Investigations of Series and Parallel Circuits

Developed by Medway consultants and ASTs.

Webaddress: <http://www.collaborativelearning.org/thebulbs.pdf>

Last updated 24th March 2016

Our talk for learning activities are designed to:

- ...build on prior knowledge.
- ...move from concrete to abstract thinking.
- ...ensure everyone works with everyone else.
- ...extend social language into curriculum language.
- ...provide motivating ways to go over the same topic more than once.

## COLLABORATIVE LEARNING PROJECT

Project Director: Stuart Scott

We support a network of teaching professionals to develop and disseminate accessible talk-for-learning activities in all subject areas and for all ages.

17, Barford Street, Islington, London N1 0QB UK Phone: 0044 (0)20 7226 8885

Website: <http://www.collaborativelearning.org>

## BRIEF SUMMARY OF BASIC PRINCIPLES BEHIND OUR TEACHING ACTIVITIES:

The project is a teacher network, and a non-profit making educational trust. Our main aim is to develop and disseminate classroom tested examples of effective group strategies that promote talk across all phases and subjects. We hope they will inspire you to develop and use similar strategies in other topics and curriculum areas. We want to encourage you to change them and adapt them to your classroom and students. We run teacher workshops and conferences worldwide but mainly in the UK. The project posts online many activities in all subject areas. An online newsletter is also updated regularly.

\*These activities are influenced by current thinking about the role of language in learning. They are designed to help children learn through talk and active learning in small groups. They work best in non selective classes where children in need of language or learning support are integrated. They are well suited for the development of speaking and listening. They provide teachers ideal opportunities for assessment of spoken language.

\*They provide scaffolding for differentiation by placing a high value on what children can offer to each other on a particular topic, and also give children the chance to respect each other's views and formulate shared opinions which they can disseminate to peers. By helping them to take ideas and abstract concepts, discuss, paraphrase and move them about physically, they help to develop thinking skills. We strongly endorse the principles of the Learning Without Limits group to which we belong.

\*They give children the opportunity to participate in their own words and language in their own time without pressure. Many activities can be tried out in pupils' first languages and afterwards in English. A growing number of activities are available in more than one language, not translated, but mixed, so that you may need more than one language to complete the activity.

\*They encourage study skills in context, and should therefore be used with a range of appropriate information books which are preferably within reach in the classroom.

\*They are generally work effectively over a wide age range because children can bring their own knowledge to an activity and refer to books at an appropriate level. The activities work like catalysts.

\*All project activities were planned and developed by teachers working together, and the main reason they are disseminated is to encourage teachers to work with each other inside and outside the classroom. They have made it possible for mainstream and language and learning support teachers to share an equal role in curriculum delivery. They should be adapted to local conditions. In order to help us keep pace with curriculum changes, please send any new or revised activities back to the project, so that we can add them to our lists of materials.

# The Bulbs - Investigations of Series and Parallel Circuits

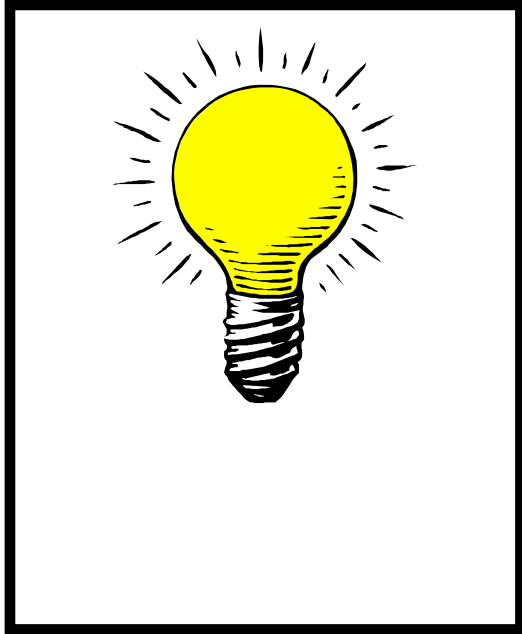
## Pupil instructions

Work in two pairs. One pair has a board with a series circuit and the other pair a board with a parallel circuit. There are three bulbs on each board indicating whether the bulbs in the circuit get brighter, get dimmer or stay the same. Shuffle the changing circuit cards and place them upside down in the centre. Pairs take turns to pick a card and decide what effect it will have on the bulbs and place it on the correct light bulb.

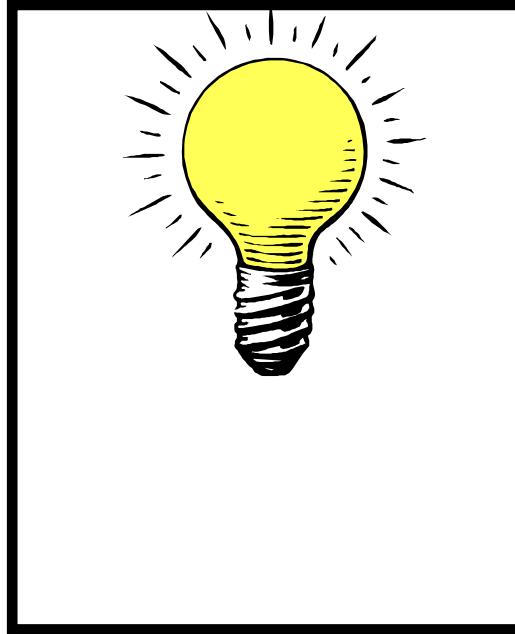
## Notes:

We have added some blank cards for teachers or pupils to add extra items. Please send back your cards for us to add to the activity. We would also welcome pictures for the changes we haven't come up with pictures for yet.

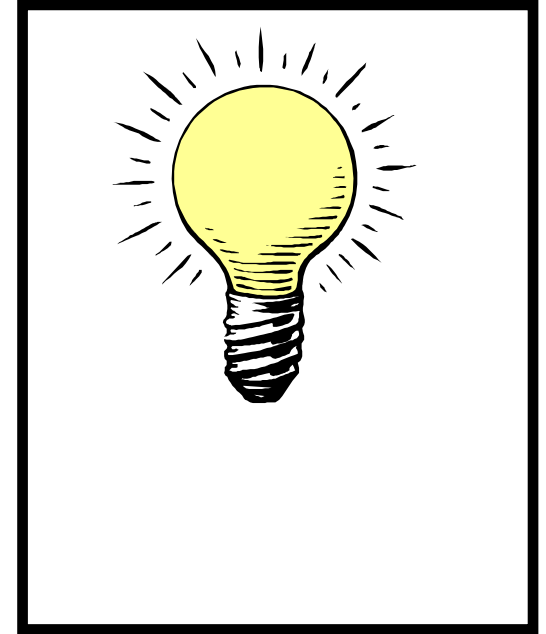
# The Bulbs - Investigations of Series and Parallel Circuits



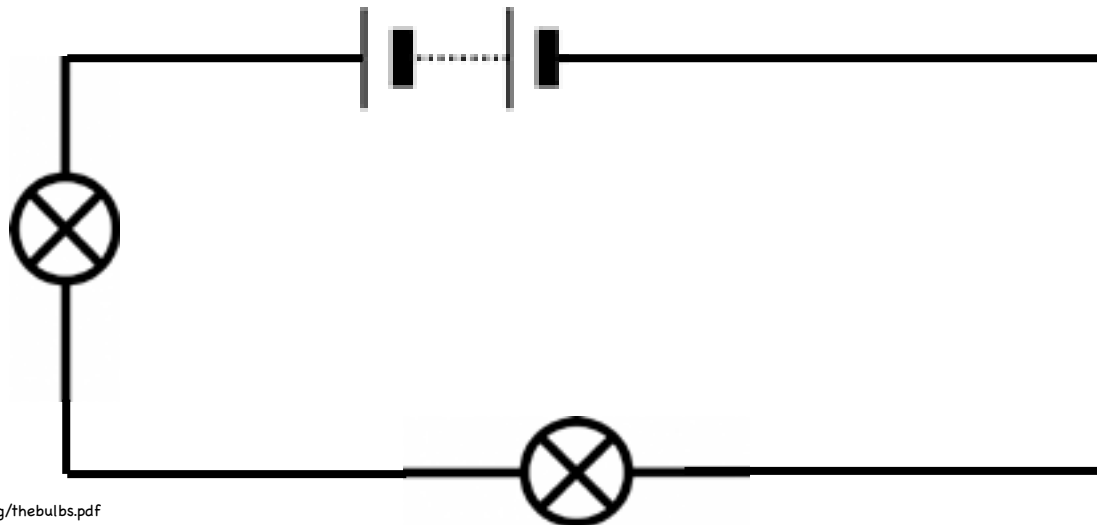
The bulbs get brighter



The bulbs stay the same brightness

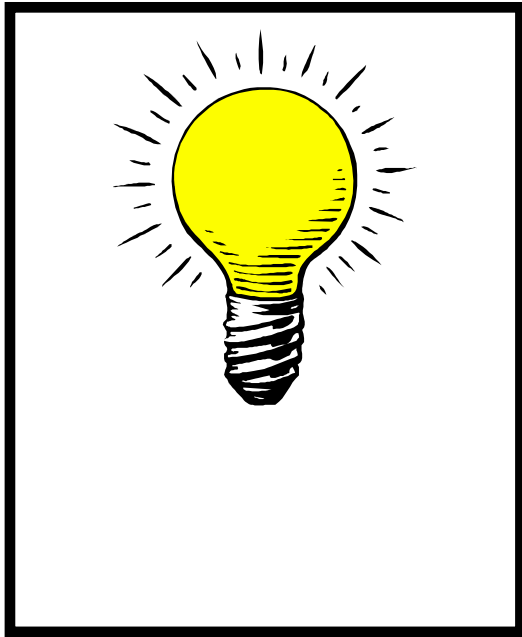


The bulbs get dimmer

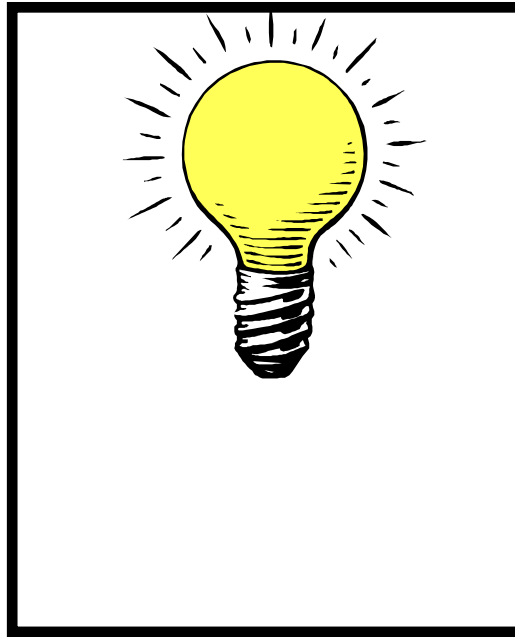


A series circuit

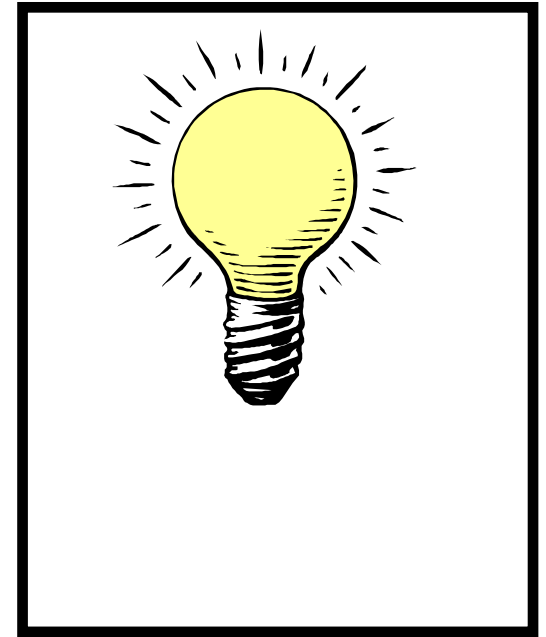
# The Bulbs - Investigations of Series and Parallel Circuits



The bulbs get brighter

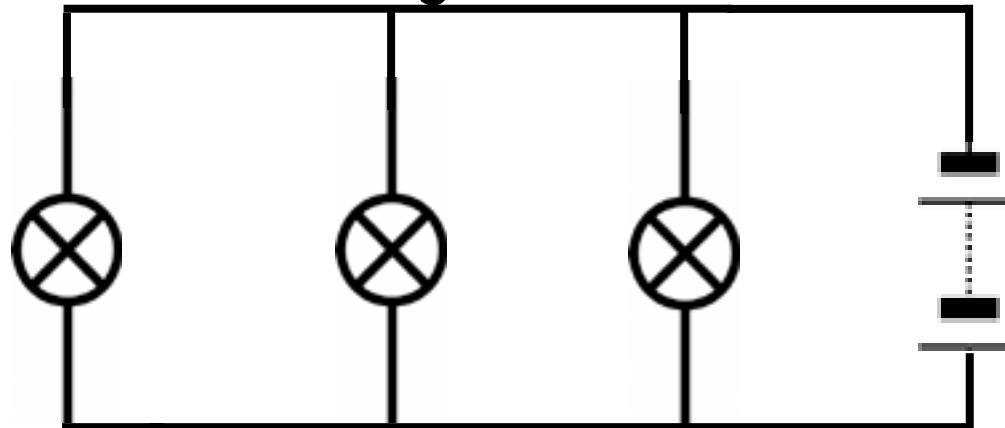


The bulbs stay the same brightness



The bulbs get dimmer

A parallel circuit



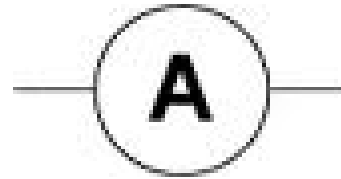
We add another cell to the battery.



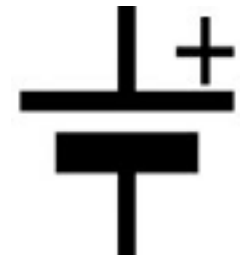
We add another bulb.



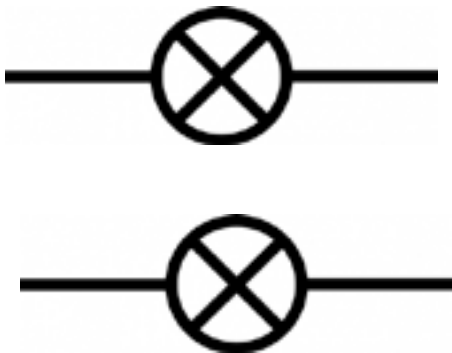
We add an ammeter



We take a cell away from the battery



We add two more bulbs



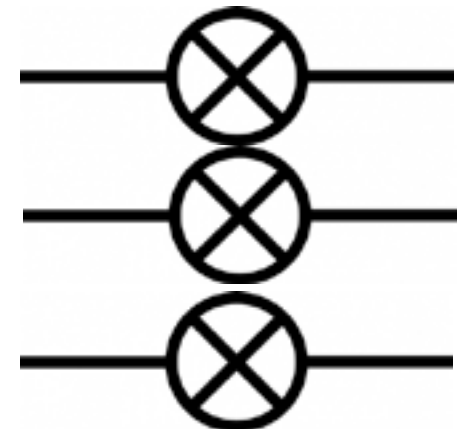
We remove a bulb



We add a switch.



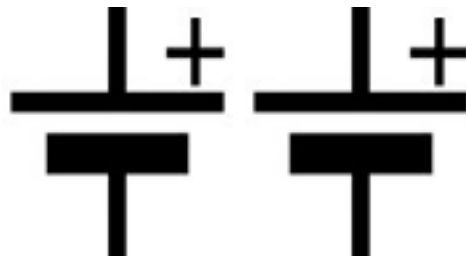
We add three more bulbs.



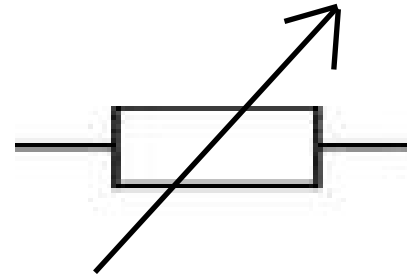
We add a voltmeter.



We add two more cells to the battery.



We add a variable resistor.



We add a resistor



We increase the voltage.

We decrease the voltage.

We increase the current.

We decrease the current.

We add more  
connecting wire.

We add

We add a

We take away

