Science - Electricity

10 Sep 10:30
Duty six : Purple

Start	Time	Activity	Requirements	Instructions	Scouter
Continuing our Cub's Choice theme of Science, today is all about Electricity					
10 Sep 10:30	5	**Activities :** Opening	Register, beans, flag, totem and skin	Grand Howl Flag Break Register Inspection - belts and shoes	Akela
Can you name some things that conduct electricity and some things that insulate against electricity? (Name a few of each with the cubs eg. wood, rubber, water, copper, metal)					
10 Sep 10:35	5	**Game :** Conductors and Insulators		Divide the pack into 2 teams. One team is conductors and one team is insulators. All the Cubs run about and try to join with their own kind. However, the insulators must try to join together and surround the conductors before they reach the power source (large tyre or chosen base).	Akela
Now we are going to run some bases - wiring a plug, kim's game and circuit games					
10 Sep 10:40	30	**Activities :** Wiring a Plug	plugs, wires, cutters, screwdrivers, instructions	**Wiring a Plug** 1. Bare the ends of the three wires inside the electrical cord for about half a centimeter, by cutting away the plastic insulation. 2. Gently twist the strands of copper wire with your fingers until each strand is tight. 3. Fold over the twisted strands. 4. Remove the plug cover by either "snapping" or unscrewing it. 5. Unscrew the little screws on each of the plug's pins. 6. Insert the twisted copper wires into the holes in the pins. 7. The green and yellow wire must always be inserted into the top pin. 8. The blue wire is inserted into the left pin (the pin is marked with a blue spot or the letter N). 9. The brown wire is inserted into the right pin (the pin is marked with a brown spot or the letter L) 10. Tighten the little screw on each of the plug's pins. 11. Make sure the electrical cord is firmly gripped by the arrestor clips. 12. Replace the cover of the plug.	Akela

				Bare the ends of the three wires inside the electrical cord for about half a centimeter, by cutting away the plastic insulation.	Gently twist the strands of copper wire with your fingers until each strand is tight. Fold over the twisted strands.	
				Remove the plug cover by either "snapping" or unscrewing it.	Unscrew the little screws on each of the plug's pins.	
				Insert the twisted copper wires into the holes in the pins. The brown wire is inserted into the right pin (the pin is marked with a brown spot or the letter L)	Tighten the little screw on each of the plug's pins.	
				Make sure the electrical cord is firmly gripped by the arrestor clips. The green and yellow wire must always be inserted into the top pin.The blue wire is inserted into the left pin (the pin is marked with a blue spot or the letter N).	Replace the cover of the plug	
Kim's game in a dark place - shine a light to see the items - how many can you remember?						
10 Sep 11:10	15	**Game :** Electricity		battery light bulb light socket wire torch solar light screw driver insulation tape split pin		Akela

				paper clip switch adapter candle pliers Use the above items in a sight Kim's game. Maybe make it fun by putting the items in a darkened room/box and the Cubs have a few seconds of shining a torch on the various items and have to remember as many as possible.	
Time for a break - not a circuit break - juice and biscuits					
10 Sep 11:25	5	**Activities :** Juice and biscuits		Juice and biscuit break	Akela
Let's make a Steady Hand Game in our Sixes to see how electric circuits actually work					
10 Sep 11:30	30	**Activities :** Steady Hand Game	• *Energizer®* Power Pack • Bulb holder • One piece of bare solid copper wire about 30" long • No. 22 insulated copper wire • Lid from a shoe box and masking tape	Is your hand quicker than your eye? Hand to eye coordination is part of almost every activity you undertake. You can build this game to develop your skill. 1. 1. Cut a long piece of insulated #22 wire at least 2' in length. Strip 3 inches of insulation off one end and make a loop to form a wand. 2. 2. Bend the 30" bare wire in a curly line. You can bend it vertical, horizontal, or in any shape you want. 3. 3. Put the curly wire through the wand and place ends through holes punched in box lid. Bend over wire ends in opposite directions as shown and tape to the inside. 4. 4. Use insulated wire to connect from the positive of the power pack to one end of the curly bare wire. Connect the negative end of the power pack to the light bulb holder and then the other end of the bulb holder to the wand. Use electrical tape at the ends of the curly wire so the light will be off when the end is reached. When the game is not in use the wand should rest at the end so that the light is not left on and the batteries are not discharged. 5. 5. Try to pass the loop all the way over the curly wire without lighting the bulb. If the wand touches the wire, the circuit is complete and the bulb turns on. As your skill increases, put more bends in the curly wire. Play with family and friends and see who can complete the challenge faster.	Akela
Would you be able to make your own electricity?					
10 Sep 12:00	10	**Yarn :** William Kamkwamba - The Boy Who Harnassed the Wind		See attached	Akela

One big circuit, a circle of Cubs, with chocolate in the middle					
10 Sep 12:10	10	**Game :** The Chocolate Game		A wrapped bar of chocolate A plate A knife and fork Some dressing-up items (at least a hat, scarf and gloves) Dice How to play: Put the bar of chocolate on the plate with the knives and forks nearby and sit the children around it in a circle. Throw the pile of dressing up clothes into the circle. Give one Cub the dice. Cubs take it in turns to roll the dice on the floor in front of them, passing them around the circle to their left. If a Cub rolls a six, they leap into the center of the circle, put on the dressing up clothes, and start to unwrap, then eat, the bar of chocolate - but only using the knife and fork. That Cub keeps going until another child rolls a six, at which point they much co-operate in handing over the dressing up clothes so that the next Cub gets a turn.	Akela
Can you live without electricity? Not long until you will have to at our Group Camp for Superheroes in October. Form a circuit - I mean Grand Howl circle					
10 Sep 12:20	5	**Activities :** Closing	Totem, Skin Badges, certificates	Announcements Badge handouts Grand Howl Flag Down Prayer Dismiss	Akela
For Cubs to make at home, just like we used today in our programme					
10 Sep 12:25	15	**Activities :** Make a Quiz Game	• *Energizer*® Power Pack • Two 12” pieces and eight 16” pieces of No. 22 insulated copper wire with approximately 1” of insulation stripped off all ends • Bulb holder • 8” x 12” cardboard • 16 paper clips • Two large nails • Ruler • Electrical tape	Looking for a fun and easy way to learn math, history, countries, capitals, etc.? Use your knowledge of electricity to make this game for you, your family, and friends. You can also adapt it to the Jungle book specifically for Cubs... • 1. Draw 7 lines across the cardboard and 1 down. Develop your own questions and answers about a subject that interests you. Write the questions on the left side and the answers on the right side. Make sure to mix up the questions and answers so they are not on the same lines. Another option would be to type up the questions and answers as shown in the table below. This could then be printed and attached to the cardboard. 1. 2. Attach paper clips to the board at each question and answer. 2. 3. Behind the board attach a wire from the paperclip of each question to the corresponding paperclip with the correct answer (one connection shown). 3. 4. Attach the two 12” wires with electrical tape to large	Akela

				nails that will be used as probes. Attach the other side of one 12” wire to the positive side of the Energizer power pack and the other side of the second 12” wire to the bulb holder. Then connect the other side of the bulb holder to the negative of the Energizer power pack. 4. 5. Place one probe on the paper clip by a question and place the other probe on the paper clip by an answer. If you select the wrong answer the light bulb does not light up. 5. 6. Place one probe on the paper clip by a question and place the other probe on the paper clip by an answer. If you select the wrong answer the light bulb does not light up.	

William Kamkwamba - The Boy Who Harnassed the Wind

Category	Yarn
Time to allocate (mins)	5

Story

William Kawkwamba - The Boy Who Harnassed the Wind

March 13, 2012 by Anthea Hudson & filed under Energy Systems, Peak Oil

When we think of wind power, we most likely think either of the huge wind farms now dotted across the globe, or the good ol' country windmills that have been the backbone of our outback stations' water supply.

But how often do we hear of windmills being built from scratch, let alone in a poor African nation, such as Malawi?

William Kamkwamba did just this, and we can share his story in his autobiography, his children's edition of the book and also on various interviews and documentaries on him that have been produced, some of which I discuss in more depth below.

I read his book *The Boy Who Harnessed the Wind* a few months back and found it quite moving. It brings home some harsh realities, which some people may wish to remain blind too… but these aren't written in a sensational way, rather just an honest re-telling of daily life, by a young man. But it's not all about hard times and despair. It's about the way William was able to move beyond just accepting his lot in life, to create something remarkable to turn it around — a fully working windmill, cobbled together out of junk parts and what he had on hand.

And possibly the most remarkable thing of all? William was only 14 years old when he did this!

In the short documentary 'Moving Windmills', William tells of his life in his poor village of Mastala, Malawi, where 60 families depended on farming for their livelihoods. Being too poor to remain in school, William spent his spare time (when he wasn't helping with the crops) trying to educate himself by reading library books. One of those books was to change his life, and that of his whole village.

William had noticed that there was a lot of wind where he lived and thought "What can I do to use that wind so that we can have something?" So, he decided to read books which contained information about windmills. A book called 'Using Energy' caught his attention. Consisting mostly of pictures, the one of a windmill drew William to it. Having no real instructions as to how to build one, William worked out, by trial and error and by referring to the picture, how to make one himself!

William recalls the first thing he powered with the windmill was a radio… and that local Malawian Reggae music was playing at the time. He then moved on to powering lights for his home.

Although he had received little interest during the building of his first windmill, and was in fact thought to be slightly crazy by many, when people realised it was useful their thoughts began to change.

On returning the library book, the librarian expressed great interest in his project, and arranged to come and see what he had done… bringing some journalists from a Malawian newspaper along too, who then, in 2006, wrote an article which was to have far reaching effects.

In 2007 William was invited to the USA as a guest at a TED conference. He was also given some wonderful experiences, such as flying in a helicopter and venturing to the top of skyscrapers. One of the highlights of his trip must surely have been when he got to visit a huge wind farm in Palm Springs, California, and to discuss his invention with fellow 'wind man' Chris Copeland of Wintec energy. Apart from his TED talk, William was also interviewed both for TV and on radio, spreading his ingenious project far and wide.

"My dream is to finish my education and in the future to start my own company about windmills." said William "Most people, they want technology, but they cannot use the internet technology without electricity. That's what I'm planning to do, to come up with reliable electricity. Yeah, that's what I'm planning to do."

At the end of this documentary is noted that in 2008 William was due to join the inaugural class of the African Leadership Academy in Johannesburg, which is the first pan-African preparatory school, and thereby taking another step in fulfilling his goals.

Also stated was the fact that in the months following this filming, William added a second windmill, solar panels, bright lighting and a deep water well to his family compound, made possible by donations that followed after his story became known.

Entry written by Sharon Venn of 1st Randburg

Make a Quiz Game

Category	Activities
Time to allocate (mins)	15
Outcome	Build a fun quiz game which lights up when the correct answer is given. Any quiz can be done to fit with various themes, eg. Jungle Book
Resources	• *Energizer*® Power Pack • Two 12” pieces and eight 16” pieces of No. 22 insulated copper wire with approximately 1” of insulation stripped off all ends • Bulb holder • 8” x 12” cardboard • 16 paper clips • Two large nails • Ruler • Electrical tape
Instructions	Looking for a fun and easy way to learn math, history, countries, capitals, etc.? Use your knowledge of electricity to make this game for you, your family, and friends. You can also adapt it to the Jungle book specifically for Cubs... • 1. Draw 7 lines across the cardboard and 1 down. Develop your own questions and answers about a subject that interests you. Write the questions on the left side and the answers on the right side. Make sure to mix up the questions and answers so they are not on the same lines. Another option would be to type up the questions and answers as shown in the table below. This could then be printed and attached to the cardboard. principles-of-electricity-quiz-game 1. 2. Attach paper clips to the board at each question and answer. 2. 3. Behind the board attach a wire from the paperclip of each question to the corresponding paperclip with the correct answer (one connection shown). 3. 4. Attach the two 12” wires with electrical tape to large nails that will be used as probes. Attach the other side of one 12” wire to the positive side of the Energizer power pack and the other side of the second 12” wire to the bulb holder. Then connect the other side of the bulb holder to the negative of the Energizer power pack. 4. 5. Place one probe on the paper clip by a question and place the other probe on the paper clip by an answer. If you select the wrong answer the light bulb does not light up. 5. 6. Place one probe on the paper clip by a question and place the other probe on the paper clip by an answer. If you select the wrong answer the light bulb does not light up.

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Documents

quiz_game.docx
