KidzLabs™ Survival Science Kit

⚠ WARNING:
CHOKING HAZARD - Small parts
Not for Children under 3 years.

TO PARENTS: PLEASE READ THROUGH THESE INSTRUCTIONS BEFORE GIVING GUIDANCE TO YOUR CHILDREN.

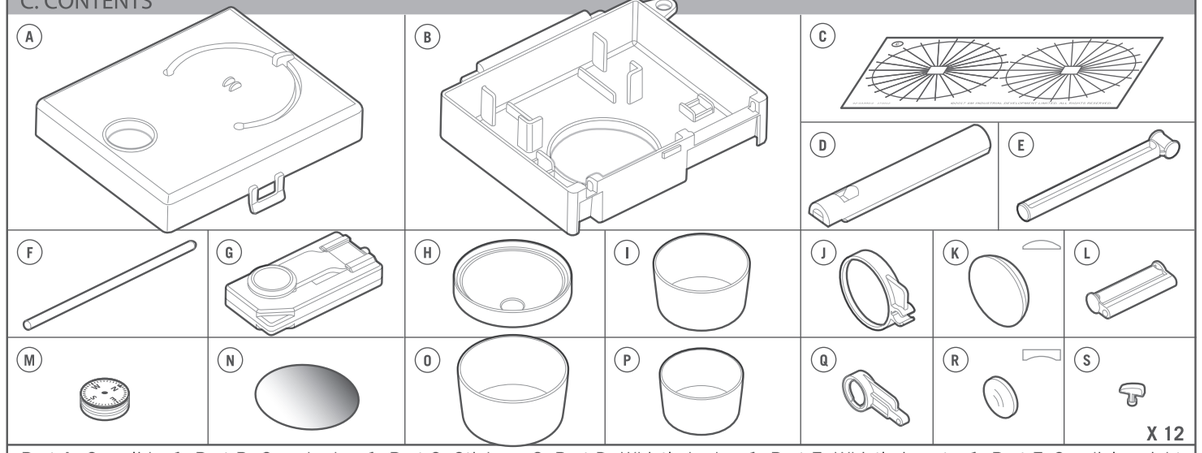
A. SAFETY MESSAGES

1. Adult supervision and assistance are required at all times. 2. This kit is intended for children over 8 years of age. 3. This kit and its finished product contain small parts which may cause choking if misused. Keep away from children under 3 years old.
PLEASE READ BEFORE YOU USE THE KIT:
Your Survival Science kit is intended for you to learn about science that can help you to survive in the wild. It is not an actual survival kit to be used in real survival situations.

B. USE OF BATTERY

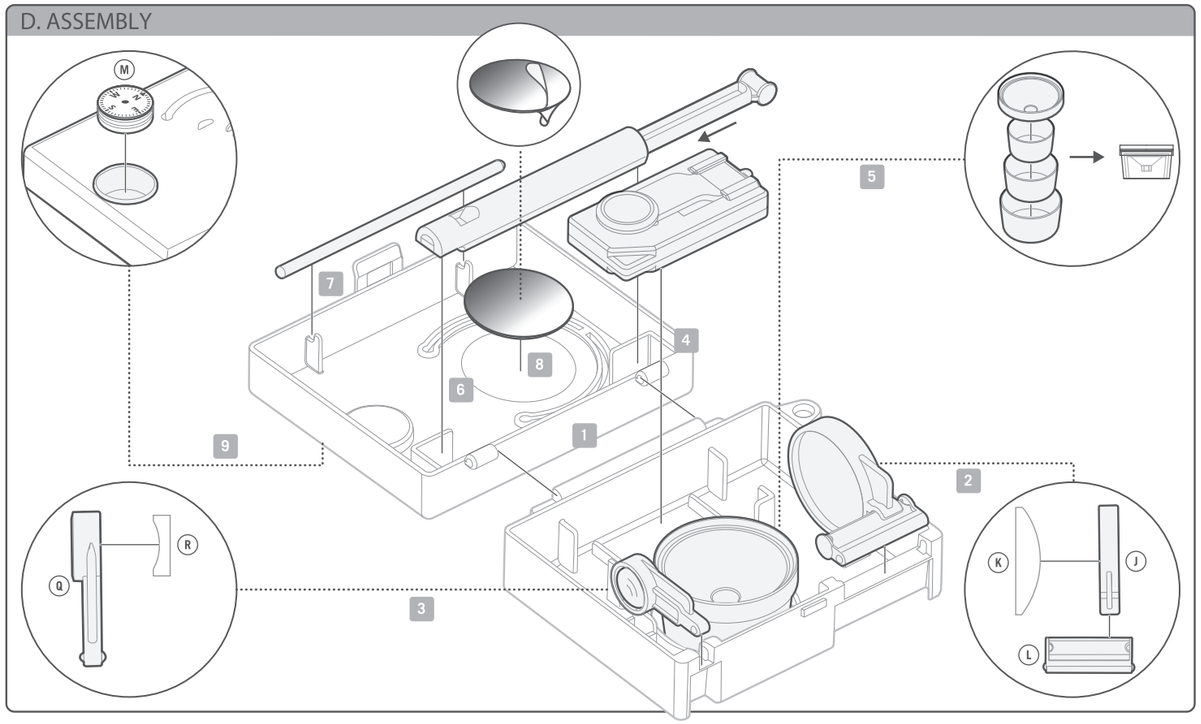
1. Use 1 x 3V button cell battery (Model CR1220). 2. Unscrew the battery case cover to replace battery. Adult supervision is required. 3. For best results, always use a fresh battery. 4. Make sure you insert the battery with correct polarities. 5. Replace exhausted battery straight away to avoid possible damage to the kit. 6. Rechargeable battery must be removed from the kit before recharging. 7. Rechargeable battery should be recharged under adult supervision. 8. Do not attempt to recharge non-rechargeable battery. 9. Remove the battery from the kit when not in use. 10. Make sure that the supply terminals in the battery case are not short circuited.

C. CONTENTS



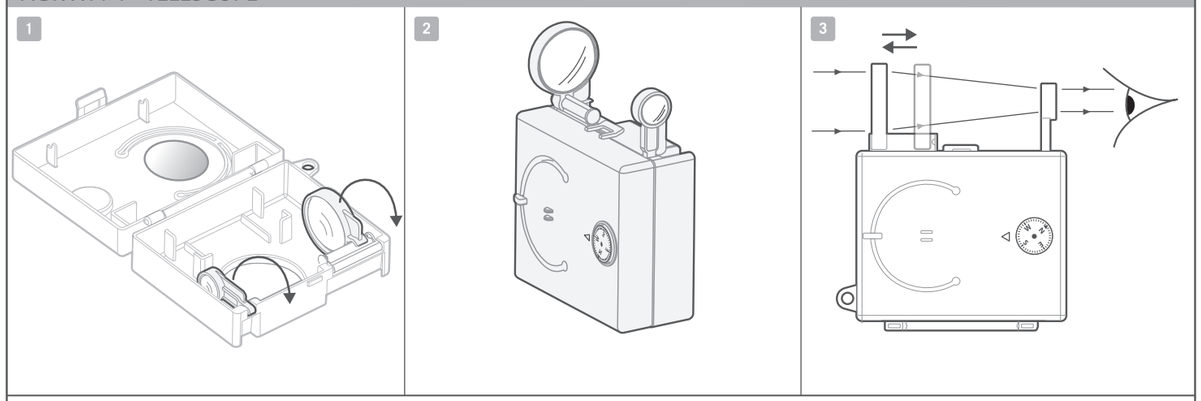
Part A: Case lid x 1, Part B: Case body x 1, Part C: Sticker x 2, Part D: Whistle body x 1, Part E: Whistle insert x 1, Part F: Sundial upright x 1, Part G: Torch x 1, Part H: Purifier lid x 1, Part I: Medium purifier ring x 1, Part J: Large lens support x 1, Part K: Large lens x 1, Part L: Lens pivot x 1, Part M: Compass x 1, Part N: Mirror x 1, Part O: Large purifier ring x 1, Part P: Purifier base x 1, Part Q: Small lens support x 1, Part R: Small lens x 1, Part S: Marker x 12.

D. ASSEMBLY



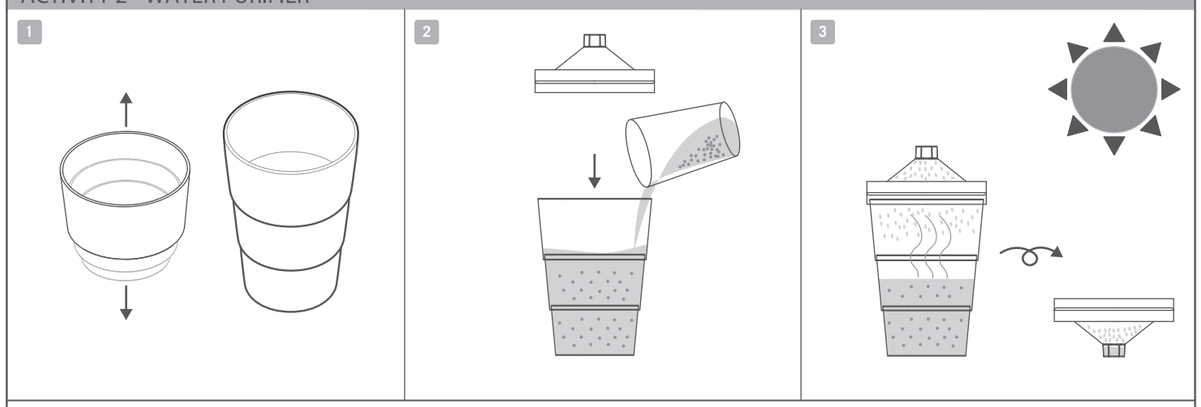
1. Carefully clip together the hinge joining the case body and the case lid.
2. The large lens has a flat side and a side that curves outwards. Push the lens into the large lens support curved-side first. Slide the large lens support onto the pivot and clip the lens pivot into the edge of the case body. Make sure that the tab on the lens support faces upwards, as in the diagram.
3. The small lens has a flat side and a side that curves inwards. Push the lens into the small lens support curved-side first. Clip the lens support into the edge of the case body. Again, make sure that the tab on the lens support faces upwards, as in the diagram.
4. Slot the torch into its slot in the case body.
5. Slot the large purifier ring into the hole in the case body. Slot the medium purifier ring into the large ring, and then the purifier base into the medium ring. Clip the purifier lid onto the edge of the large ring.
6. Slide the whistle insert into the whistle, and push the whistle into its slot in the case lid.
7. Clip the sundial upright into the case lid.
8. Remove the backing from the mirror and stick it on the inside of the lid. You also need to remove the protective film on the mirror.
9. Clip the compass into its slot on the outside of the case lid. You can tie a string to the case or attach a key ring to help you to carry the case around and keep it safe.

ACTIVITY 1 - TELESCOPE



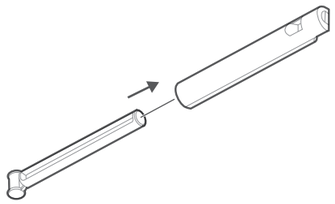
In a survival situation, you might do this to look for an escape route in the distance or things in the landscape that might help you survive.
1. To set up the telescope, open the case and unfold both lenses.
2. Close the case and turn the body upright.
3. Put your eye to the small lens and aim the telescope at an object in the distance. Move the large lens forwards and backwards to bring the object into focus.
How it works: The two lenses bend light rays coming from a distant object so that they seem to be coming from an object that is closer. The large lens bends the rays towards each other, while the small lens bends them away from each other. This makes two light rays coming from a point on the object appear to be coming from a point that is closer.

ACTIVITY 2 - WATER PURIFIER

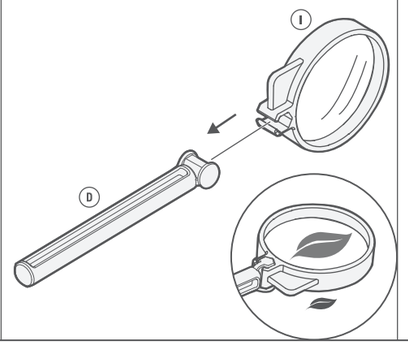


Water is the most important thing you need to survive. You can live for weeks without food, but you can only survive a few days without water. Dirty water from ponds or streams can make you ill, so you need to purify it, and you can do that with the water purifier.
Important: Try using the purifier for fun with clean water or salt water, but don't drink purified dirty water from it just in case some bugs get into the clean water.
1. Pull the sections of the water purifier out to form them into a cup.
2. Fill the cup with water. Turn over the lid and place it on top of the cup. Please note: The more you fill the cup with water, the less time it requires to evaporate.
3. Put the water purifier in direct sunshine. It will take a few hours for the purifier to work. Once droplets of pure water have formed on the underside of the lid, turn it over and wait for the water to channel down into the reservoir. Please note: You may shake the lid slightly to speed up the process.
How it works: The heat of the Sun's rays warms the water and air inside the container. This makes water evaporate from the water surface, forming water vapour (the gaseous form of water) in the air above it. The cup's lid is cooled by the air around the cup, and some water vapour that hits its underside cools and turns back into liquid water. Any chemicals or bugs in the water inside the cup are left behind as the water evaporates, so the water on the underside of the lid is pure water.

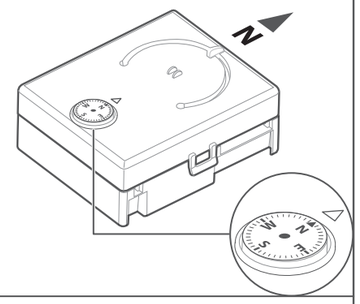
ACTIVITY 3 - THE WHISTLE



ACTIVITY 4 - MAGNIFIER



ACTIVITY 5 - COMPASS



ACTIVITY 3 - The Whistle
In a survival situation, a whistle can be used to call for help or to communicate with other people who might be in trouble. Six short blasts on a whistle means 'I NEED HELP!'
1. Blow into the whistle, and slide the whistle insert in or out of the whistle to change the pitch of the whistling sound.
How it works: Sound is made when air vibrates (your ears detect the vibrations that you hear as sounds). When you blow into the whistle, a stream of air hits the wedge-shaped part of the whistle at the end of the hole in the top of the whistle. The wedge makes the air divide and makes the air inside the whistle vibrate backwards and forwards. These vibrations make the whistle's sound. Moving the insert in or out changes the length of the space inside the whistle, which changes how quickly the air vibrates. Sliding the plunger in shortens the tube, which makes the vibrations faster, which in turn increases the pitch of the sound. The note produced is higher.

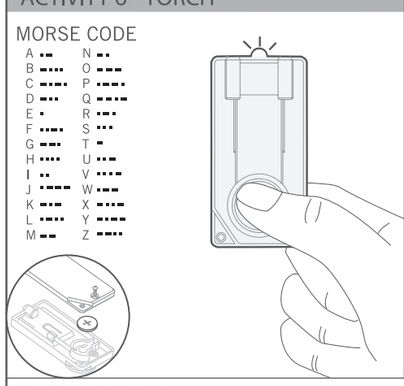
ACTIVITY 4 - Magnifier
It's always useful to have a magnifier in an emergency situation. You can use it to concentrate the Sun's rays to make heat to start a fire, to look at a wound such as a splinter, or to identify bugs.
1. Connect the large lens holder to the whistle insert to make the magnifier.
How it works: A magnifier bends light rays coming from an object so that the rays appear to be coming from a much larger object, enabling you to see it in more detail. Imagine two light rays coming from one point on an object, such as a bug. The magnifier bends the rays towards each other so that when you look through the lens, the rays seem to be coming from a larger object further away. If you use the lens to concentrate the Sun's rays, the lens bends all the light rays and heat rays coming from the Sun into a small area, which concentrates the heat.

ACTIVITY 5 - Compass
A compass helps you to find your way to safety. You can use it to make sure you are walking in a straight line in thick woodland or jungle, or when it's misty.
1. Hold the survival case level in your hand, or place it down on level ground. The compass dial will turn so that the "N" points to the north, the "S" points to the south, and so on. If you want to walk in a particular direction, hold the box with the arrow next to the compass pointing forward, turn your body until the direction you want to walk in on the compass dial lines up with the arrow, and walk forward. For example, if you line up "W" with the arrow, you will be walking to the west. To align a map, identify which direction is north or south on the map and turn the map until it matches the dial on the compass. This will help you to identify real-world features on the map, such as hills.
How it works: The compass dial is a magnetised piece of steel. It has two magnetic poles: one north pole and one south pole. The dial always turns so that its "north" tip points to the Earth's North Magnetic Pole and its "south" tip points towards the Earth South Magnetic Pole — it doesn't matter how you turn the compass's case, the dial always points the same way.

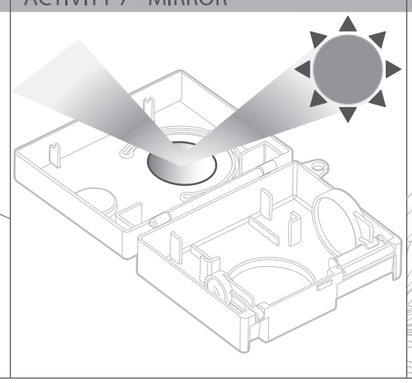
ACTIVITY 6 - TORCH

MORSE CODE

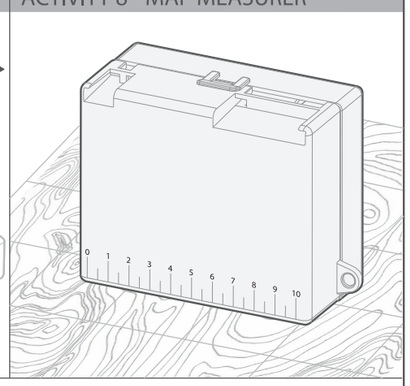
A	•–	N	–•
B	–•••	O	–––
C	–•–•	P	•––•
D	–••	Q	––•–
E	•	R	•–•
F	••–•	S	•••
G	––•	T	–
H	••••	U	••–
I	••	V	•••–
J	•–––	W	•––
K	–•–	X	–••–
L	•–••	Y	–•––
M	––	Z	––••



ACTIVITY 7 - MIRROR



ACTIVITY 8 - MAP MEASURER



ACTIVITY 6 - Torch
In emergency situation you can signal for help with a torch. Six flashes is the international signal for help, but you can also send messages using Morse code. Of course, the torch will also help you to see in the dark. Press the button to make the LED light up, and release it to make the LED go out again. There is a Morse code guide on the back of the torch. The code for each letter is made up of dots, dashes, or a combination of both. To send a letter in Morse code, use a quick press on the torch button for a dot, and a longer press for a dash. Leave a short gap between each letter if you are sending a word, and a longer gap between each word. For example, to send the words SOS and HELP, you would use the following sequences of short and long flashes:

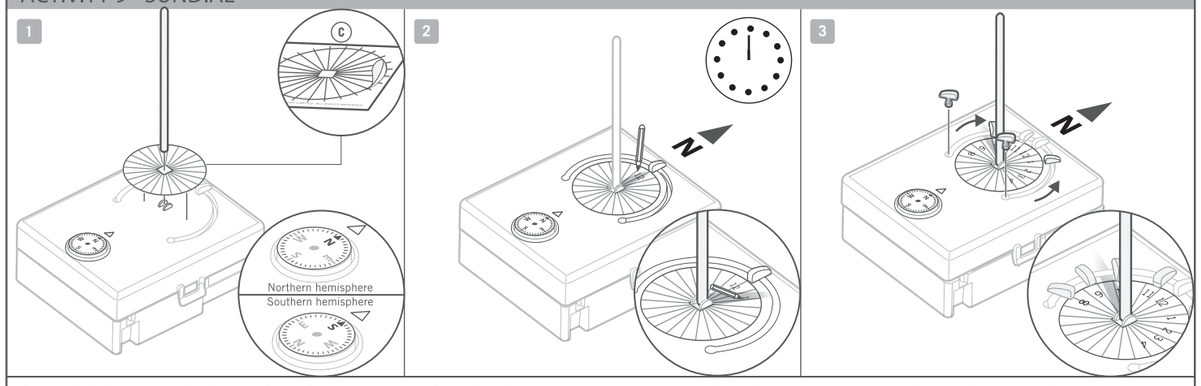
• • • – – – • • • • • • • • • – • • • – – •
S O S H E L P

How it works: Inside the torch is a simple electric circuit made up of a battery, wires, an LED (light-emitting diode) bulb and a switch. When you press the button, you close the switch, which completes the circuit, making electricity flow through the LED, making it glow. Remarks: Remove insulation slip prior to first use. You may unscrew to replace the battery with 1 x 3V CR 1220 button cell.

ACTIVITY 7 - Mirror
A mirror is a very simple tool for calling for help or sending signals, and it works in the daytime when a torch would not. If you need help in the wild and you can see a plane, helicopter or ship in the distance, open the survival case and angle the mirror so that the Sun's rays are reflected towards it. Aim the mirror at an angle halfway between the Sun and your target. Those on board will see a bright flash. You can twist the mirror from side to side to send a series of flashes.
How it works: The mirror reflects the Sun's rays very well, sending them off in a new direction.

ACTIVITY 8 - Map Measurer
There is a centimetre ruler on the side of the case for measuring distances on a map. Place the ruler along the line between two places on a map and note the distance in centimetres. Move the ruler to the scale on the map to read off how far the distance is in the real world.
How it works: The scale of a map is the ratio of a distance on the map to the corresponding distance on the ground. The actual distance can be calculated by knowing the map distance and the ratio.

ACTIVITY 9 - SUNDIAL



A sundial is a simple device for telling the time if you've lost your watch or your phone's battery has run down. The upright piece casts a shadow on the dial, and the position of the shadow is a guide to the time of day.
1. You need to calibrate the sundial before you can use it. Take the sticker from the template and place onto the surface of the case lid. Attach the sundial upright to the top of the survival case and place it down on level ground in the sunshine. If you live in the Northern Hemisphere, turn the case so that N on the compass lines up with the arrow. In the Southern Hemisphere, line up S with the arrow.
2. Start from 12 p.m. (noon), and afterwards on every hour, write down the hour on the sticker with a pencil in line with the shadow, and work your way until you reach you reach 12 p.m. (noon) on the next day. At 12 o'clock, the shadow will always lie on the centre marker in the track.
3. Slide the markers along the track and place them on the hours marked on the sticker. Remarks: The shadow will change according to season. Please re-calibrate the markers when the season changes to match with the correct time. You can erase the pencil mark from the sticker, or cover it with a new sticker.
How it works: A sundial works because the Earth rotates on its axis once every 24 hours, which makes the Sun appear to move across the sky from east to west. The upright's shadow sweeps round as it does. At midday (ignoring any adjustment of the clocks for daylight savings), the Sun will always be directly south (in the Northern Hemisphere) or directly north (in the Southern Hemisphere), so the sundial's shadow will always point north or south.

E. TROUBLESHOOTING

Telescope
• If the telescope doesn't magnify objects as expected, make sure that the flat and curved sides of the lenses are inserted correctly, and that the small lens is closest to your eye.
Compass
• If the compass spins round or seems to point in the wrong direction, check that there are no metal objects close to it, that the needle is free to spin (you might need to give it a gentle shake), and that you are holding it level.
Magnifier
• If the object is out of focus, move the lens closer to it, or further away from it.
Water purifier
• If no condensation appears on the lid after a while, make sure that the purifier is exposed to direct warm sunshine, and is not in shade.
Sundial
• If the shadow does not fall on the markings, check that the sundial is facing north or south correctly.
• If the sun is not shining when it's time to make a mark on the hour, you can fill in missing marks over the next few days.

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QUESTION AND COMMENTS: We value you as a customer and your satisfaction with this product is important to us. If you have comments or questions, or you find any part of this kit missing or defective, please do not hesitate to contact our distributor in your country. You will find the address printed on the package. You are also welcome to contact our Marketing Support Team: Email: infodesk@4m-ind.com, Fax (852) 25911566, Tel: (852) 28936241, Web site: WWW.4M-IND.COM