

MOTORISED ROBOT HEAD

PLEASE SCAN THE QR CODE FOR VIEWING MULTI-LANGUAGE INSTRUCTIONS.



FR. Veuillez scanner le code QR pour afficher les instructions multilingues pour ce kit. DE. Bitte scannen den QR-Code, um die mehrsprachige Anleitung für dieses Set anzusehen. NL. Scan de QR-code om de instructies voor deze set in verschillende talen te bekijken. IT. Scansiona il codice QR per visualizzare le istruzioni multi-lingua per questo kit. ES. Escanee el código QR para ver instrucciones en varios idiomas para este kit. JA. QRコードをスキャンして、本キットの多言語説明書をご覧ください。

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

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

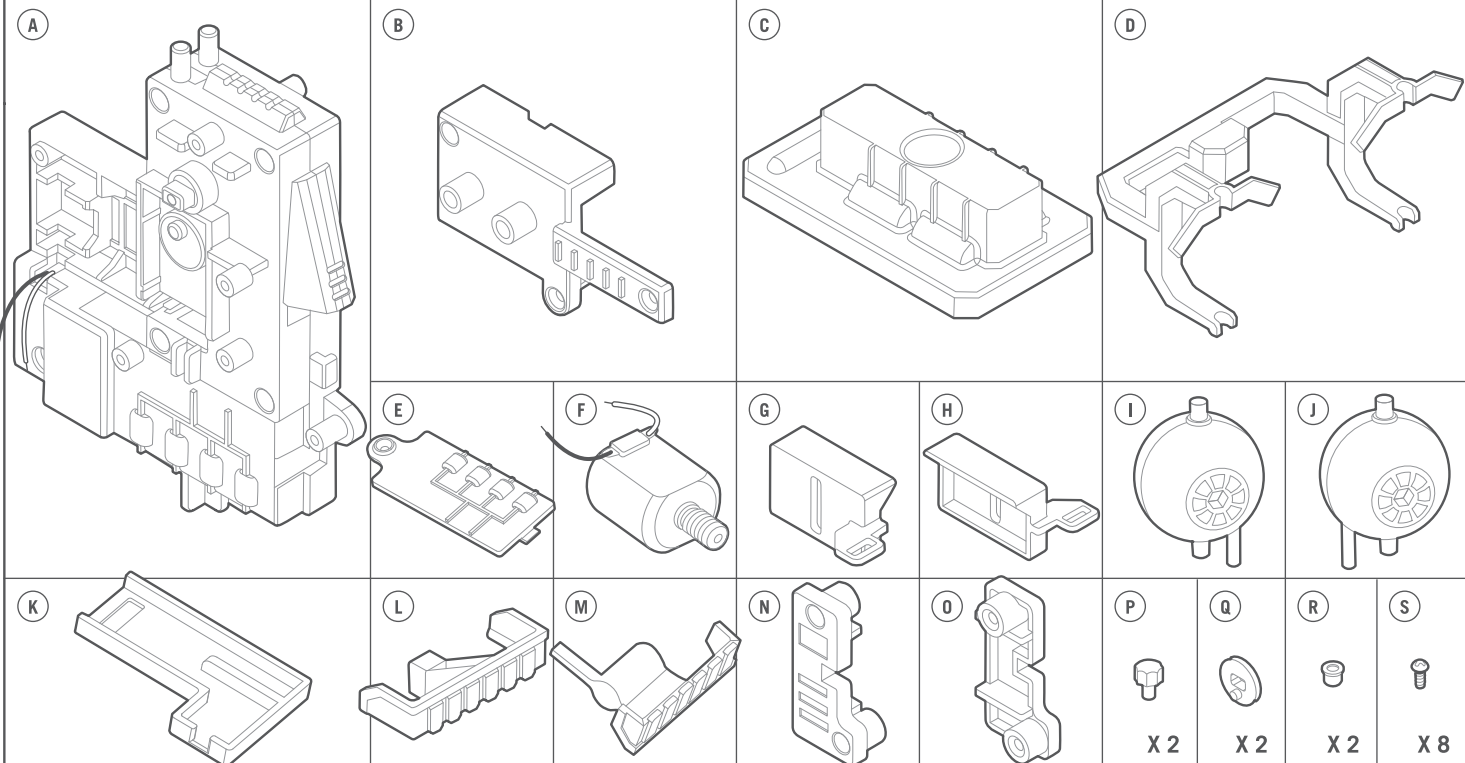
A. SAFETY MESSAGES

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.
4. To prevent possible short circuits, never touch the contacts inside the battery case with any metal objects.
5. Only install batteries after you have assembled the product. Adult supervision is required.

B. USE OF BATTERIES

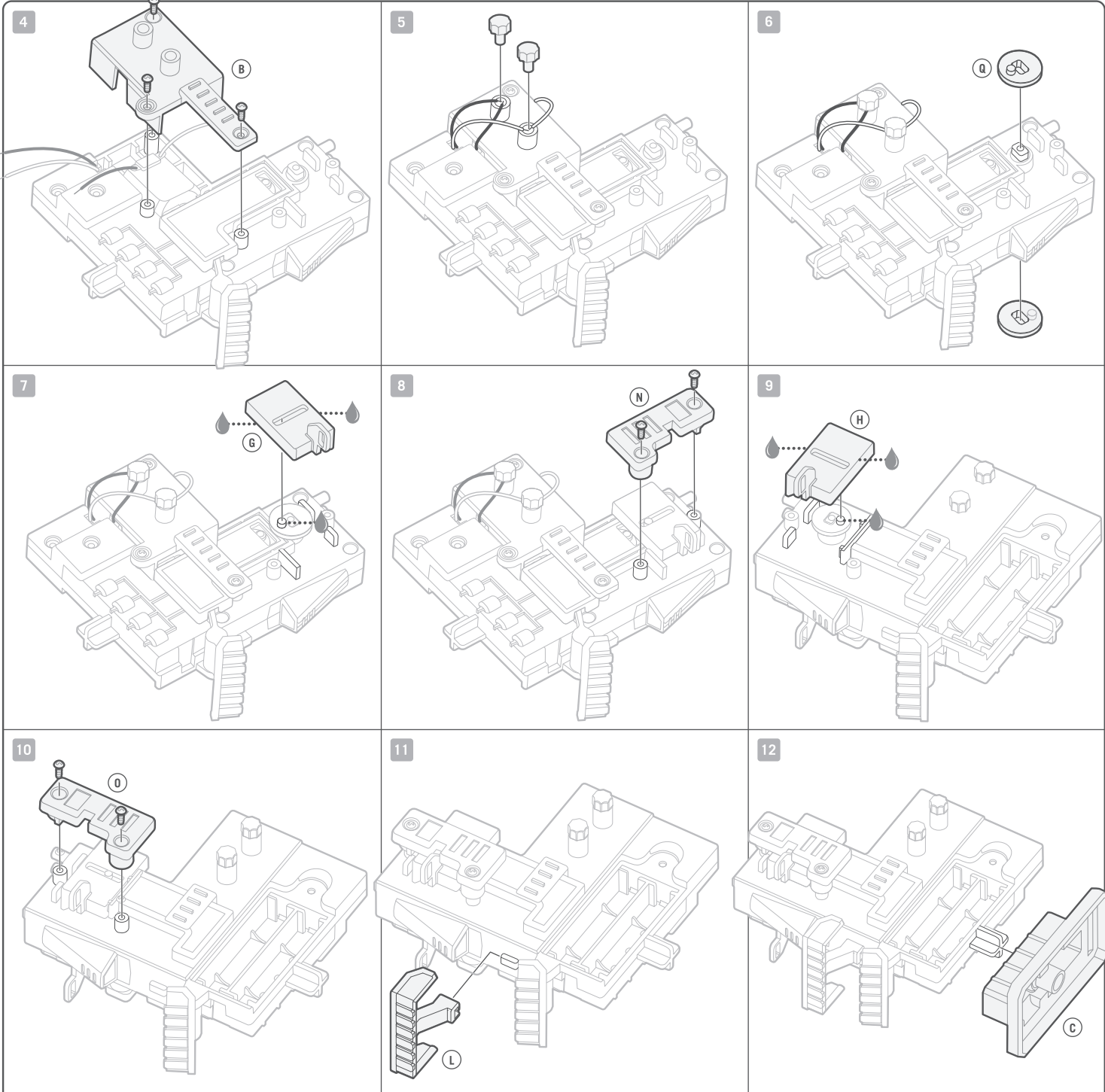
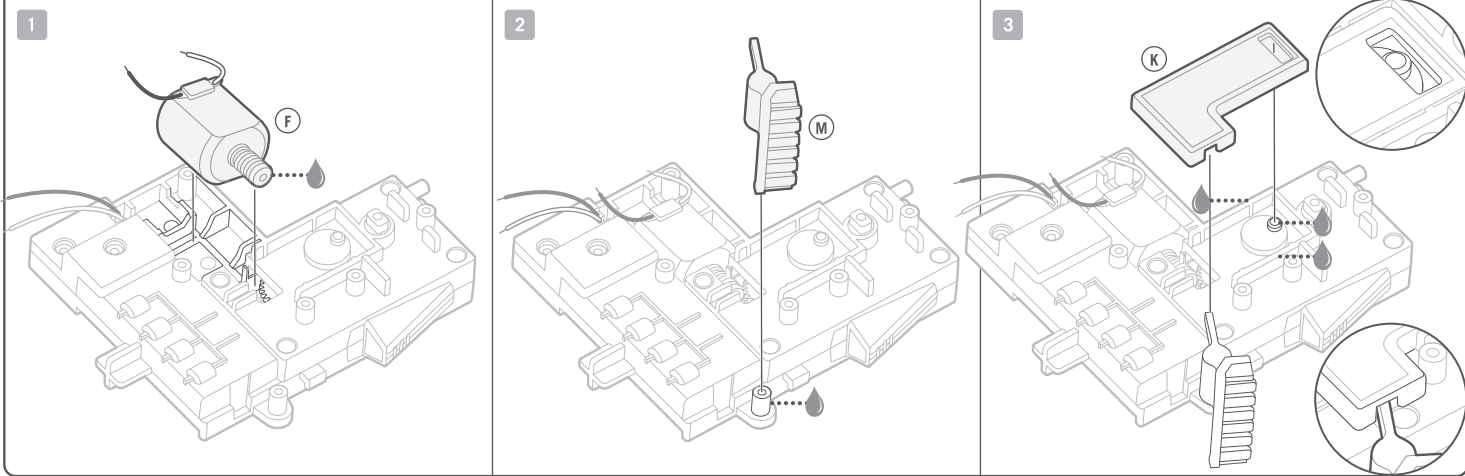
1. Requires two 1.5V AAA batteries (not included).
2. For best results always use fresh batteries.
3. Make sure you insert the batteries with the correct polarities.
4. Remove the batteries from the kit when not in use.
5. Replace exhausted batteries straight away to avoid possible damage to the kit.
6. Rechargeable batteries must be removed from the kit before recharging.
7. Rechargeable batteries should be recharged under adult supervision.
8. Make sure that the supply terminals in the battery case are not short circuited.
9. Do not attempt to recharge non-rechargeable batteries.
10. Do not mix old and new batteries.
11. Do not mix alkaline, standard (carbon-zinc), or rechargeable batteries.

C. CONTENTS



Part A: Body x 1, Part B: Motor cover x 1, Part C: Base x 1, Part D: Eye frame x 1, Part E: Battery cover x 1, Part F: Motor x 1, Part G: Slider (right) x 1, Part H: Slider (left) x 1, Part I: Eye (right) x 1, Part J: Eye (left) x 1, Part K: Jaw cover x 1, Part L: Upper jaw x 1, Part M: Lower jaw x 1, Part N: Cover (right) x 1, Part O: Cover (left) x 1, Part P: Terminal caps x 2, Part Q: Cam wheel x 2, Part R: Pupils x 2, Part S: Screws x 8. Also required but not included in this kit: a small crosshead screwdriver, 2 x 1.5V AAA batteries.

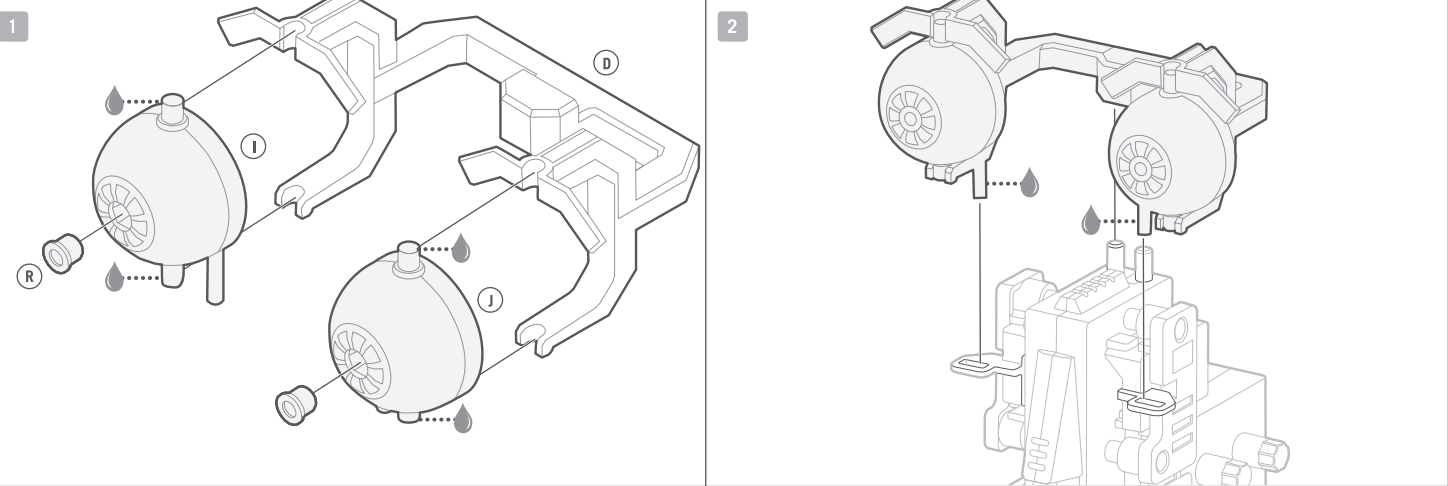
D. MAIN BODY ASSEMBLY



Remarks: It is recommended that you apply some lubricant to the joints or moving parts when assembling the product. This helps to reduce the friction and enhance the mechanical performance. You may use cooking oil or lotion for this purpose. In the instructions, the "waterdrop symbols" indicate the areas which may require lubrication.

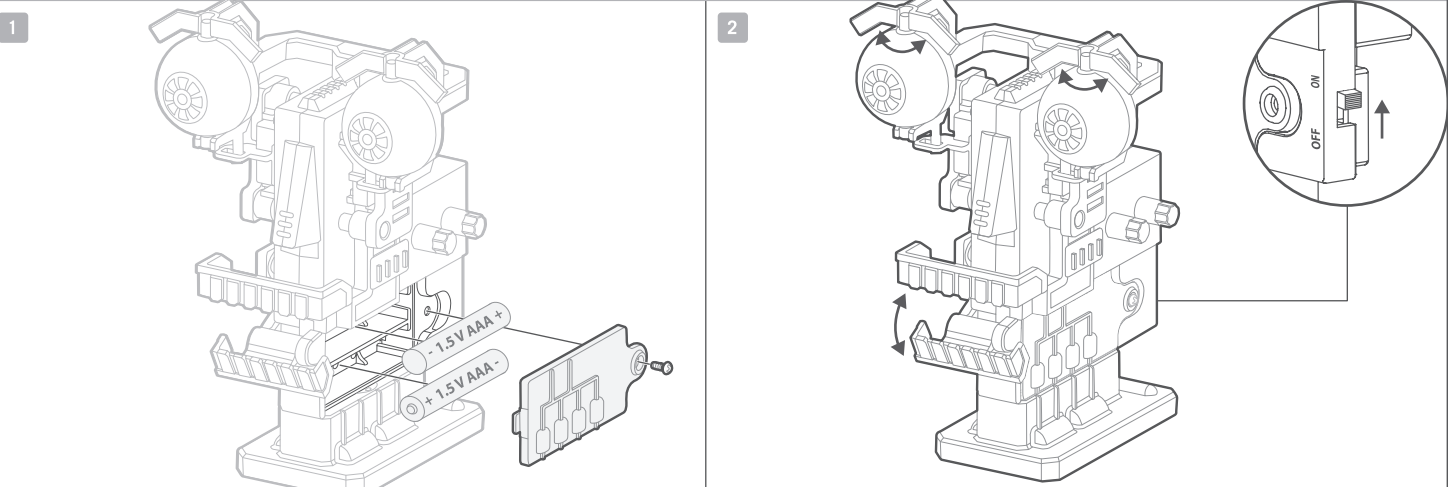
1. Slot the motor into the body with the connections for the wires facing upwards. Check that the worm gear on the motor interlocks with the gear inside the body.
2. Slot the lower jaw onto its pin on the body.
3. Install the jaw cover into the side of the body. The pin on the cam wheel should fit in the upper slot on the cover, and the arm on the lower jaw should fit into the lower slot on the cover.
4. Install the motor cover, making sure that the black wire from the motor comes out from underneath and that the red wire on top is fed through the slots in the motor cover. Secure the cover with three screws.
5. Put the red wire from the motor and the red wire from the battery case into one of the terminals, making sure that the bare metal of the wires touches the metal of the terminal. Secure the wires with a terminal cap. Repeat with the black wires from the motor and the battery case.
6. Push the cam wheels onto the rectangular shafts on either side of the body. To make the robot's eyes move in the same direction, install the cams with their pins in the opposite direction. Placing the pins in the same direction will make the eyes move in the opposite direction.
7. Install the slider (right) over the cam (right). The pin on the cam fits into the slot on the slider. Ensure that the slider sits in between the highlighted area on the diagram.
8. Place the cover (right) over the slider and onto the slot on the body. Secure it in place with two screws.
9. Repeat step 7 with the slider (left).
10. Repeat step 8 with the cover (left) on the other side of the body.
11. Install the upper jaw onto the body.
12. Push the body onto the base.

E. EYE ASSEMBLY



1. Push the pupils into the eyes. Clip the eyes into the frame. Check that the frame is the correct way up and that the eyes are the correct way round (with the pins on the inside of the frame).
2. Carefully slot the frame onto the top of the body. Guide the pins on the eyes into the slots in the sliders.

F. OPERATION

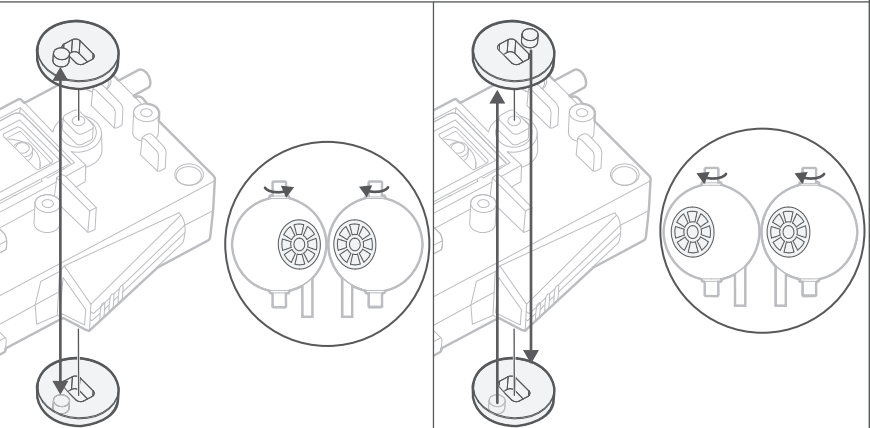


1. Insert two 1.5V AAA batteries into the battery compartment, making sure that the flat ends of the batteries are against the springs in the compartment. If the motor runs straightaway, slide the switch to the OFF position. Replace the battery cover and secure it with a screw.
2. Slide the switch on the back of the body to the ON position. Watch as the Robot Head's eyes swivel from side to side and its jaw opens and closes!
- Congratulations! Switch on Your Robot Head and it is ready for action!

REMARKS

You can change the movement of the eyes by changing the positions of the cams. For example, in the left-hand diagram, pointing the pins in same direction will make the pupils of the eye move together and then apart.

In the right-hand diagram, pointing the pins to opposite sides will make the pupils move in the same direction.



G. HOW IT WORKS

The parts are moved by a fascinating mechanism. Here's how it works:

- The motor, powered by the batteries, turns gears inside the body. The motor rotates quite fast, but the gears reduce this speed of movement so that the two shafts (one for the eyes and one for the jaw) turn slowly.
- The cam that operates the jaw cover moves the jaw up and down. This is because the slot in the jaw cover for the cam pin is horizontal. The cover moves the lever arm on the jaw up and down to make the jaw open and close.
- The slider is able to move back and forth with the cam set up on both sides. The slider pushes the handle on each eye causing it to rotate about the pivot point on the frame.

H. TROUBLESHOOTING

If the motor does not turn:

- Check that the batteries are the correct way round in the battery compartment.
- Make sure that the bare wires under the base are touching the metal terminals.

If this does not work:

- Replace the batteries with fresh batteries and retry.

If the eyes do not turn or the jaw does not move:

- Check that the pins on the three cams are located in the slots in the sliders or the jaw cover.
- Check that none of the moving parts have become jammed.

I. FUN FACTS

- Robots with human features like the Robot Head are called humanoid robots. Robots that look exactly like humans are called androids.
- Some robots have two electronic eyes in the form of video cameras. These give the robot stereo vision, just as humans have, because they give two slightly different angles of view. A robot's computer uses the two images to work out how far away objects are.
- Robot vision is becoming very intelligent. Robots such as self-driving cars can identify everyday objects in their vision, such as humans and cars. They do this by comparing objects in images from their cameras to digital three-dimensional models of the objects stored in their memories.
- Surveillance robots, or security robots, are like robot security guards. They move around on wheels or tracks, looking for signs of life where there shouldn't be any.
- Cams (the wheels with pins on them) are an important part of many different machines, where they turn circular movement into linear (backwards and forwards) movement
- Android robot faces contain many small motors that move the jaw, mouth, cheeks and eyes so that the robot can appear to talk, smile and frown.
- In the future it might be hard to tell the difference between an android and a human!
- People normally interact naturally with robots with human-like heads because the robot has the same pattern of eyes and mouth as a human face.
- Advanced robot heads can hold a simple conversation with a human!
- As well as vision sensors, mobile robots can have infra-red sensors, ultrasonic sensors and radar sensors that allow them to detect objects around them.