

Pepper
Mint

IN

THE MAGNIFICENT Mars EXPEDITION



THAMES & KOSMOS





Pepper Mint

Safety Information

WARNING! Not suitable for children under 3 years. Choking hazard — small parts may be swallowed or inhaled. Strangulation hazard — long cords may become wrapped around the neck. This kit contains a functional sharp needle. Do not injure yourself!

Keep packaging and instructions as they contain important information.

INSTRUCTIONS FOR HANDLING THE SLIME POWDER

Magnetic slime powder (15 – 18 g powder, No. 717698)

Main components: Locust bean gum, guar gum, silica, and iron powder

Instructions for handling the slime powder: Do not ingest. Only perform experiments as described in the instructions. Do not put the products in the mouth or eyes. When making the slime, work slowly and calmly so that no dust is spread. Wash your hands thoroughly after experimenting. If the products accidentally come into contact with the skin, immediately wash under running water. In case of contact with eyes, rinse with plenty of water with eyes open if necessary. In case of swallowing, rinse the mouth with water and drink plenty of fresh water. Do not induce vomiting. In case of doubt, seek immediate medical help and take the packet for reference. Keep the materials locked up and out of the reach of small children and animals. Use the slime carefully as it sticks to various materials such as carpets and tables. These can be cleaned with water. Dispose of empty bags and other residual materials with household waste.

Experiment area: The area should be free and clear of obstacles, away from food, well lit, and ventilated. A solid table should be used with an easily cleanable surface. Do not eat or drink in the experiment area. After experimenting, clean the work area and test materials and wash hands thoroughly.

Opening the slime powder packet: Cut the top corner of the packet with scissors. Never open the packet with your teeth. Make sure that the label remains readable. The opened packet can be folded over at the open corner and closed with a paper clip.

Disposal: Your slime contains no harmful preservatives and therefore lasts only a few days. Dispose of the residual materials in the household trash and rinse.



DISCOVER EXCITING ADVENTURES AND CLEVER ✨ Experiments

With great models
made of wood



ThamesandKosmos.com



Pepper Mint

Dear Parents and Adult Supervisors

This STEM experiment kit gives your child a fun way to discover the basic principles of magnetism. This kit includes everything needed for the experiments, except a few common household items. Please help your child obtain these things.

Along with step-by-step instructions, this manual includes a story that unfolds alongside the experiments. The heroine of the story is Pepper Mint — an eleven-year-old girl whose creativity and cleverness help her to find her way through a series of small adventures and to overcome various challenges. Using the character figure and the rocket, your child can play along with the story.

The Magnificent Mars Expedition set offers a total of seven exciting experiments. Each experiment adds another element to the rocket: Magnetic field detector, weightless Pepper, a compass, magnetic elevator, Mars rover, magnetic slime, and more.

Every project provides a short explanation of the physics behind it in a fun and engaging way. Along the way, children will learn why magnets have powers, how to make them visible, and what magnetic fields are all about.

Children in this age group are at different stages of development, so you can decide in advance which experiments your child can perform alone and where they will need your help. Please provide them with the help and advice that they need and check the completed assemblies for each experiment.

This kit is not suitable for children under the age of eight. Please keep small children and animals away from the experiments and read through the safety information with your child. Keep the instructions handy for reference at all times.

We hope you enjoy experimenting and playing!

Here's what to do:

- 1 Read the story or get somebody to read it aloud
- 2 Carry out the experiments
- 3 Learn through playing

I'm Pepper Mint.

I've got lots of good ideas — and sometimes I can get a little carried away with my projects. But they usually work out in the end! This time, I'm preparing a space mission to Mars. Can you help me with it?





Make sure you have all of the components of your kit and check them off:

✓	No.	Description	Quantity	Art.-No.
<input type="radio"/>	1	Wooden sheet, plain	1	722087
<input type="radio"/>	2	Wooden sheet, printed	1	722087
<input type="radio"/>	3	Cardboard sheet	1	722086
<input type="radio"/>	4	Paper clips	3	722088
<input type="radio"/>	5	String, 30 cm	1	722090
<input type="radio"/>	6	Test tube with iron filings	1	722089
<input type="radio"/>	7	Test tube with lid	1	722093
<input type="radio"/>	8	Compass	1	722092

✓	No.	Description	Quantity	Art.-No.
<input type="radio"/>	9	Magnet	1	721599
<input type="radio"/>	10	Magnetic ball	1	722095
<input type="radio"/>	11	Slime powder, 15–18 g	1	717698
<input type="radio"/>	12	Petri dish with lid	1	722094
<input type="radio"/>	13	Polystyrene foam disk	1	722091
<input type="radio"/>	14	Needle	1	722071
<input type="radio"/>	15	Metal wire	1	722096
<input type="radio"/>	16	Sandpaper	1	720574

You will also need:

Scissors, ruler, tap water, craft glue, sticky tape, wood glue, kitchen knife, kitchen scale

Tip!

If you are missing any parts, please contact Thames & Kosmos customer service.

US: techsupport@thamesandkosmos.com

UK: techsupport@thamesandkosmos.co.uk



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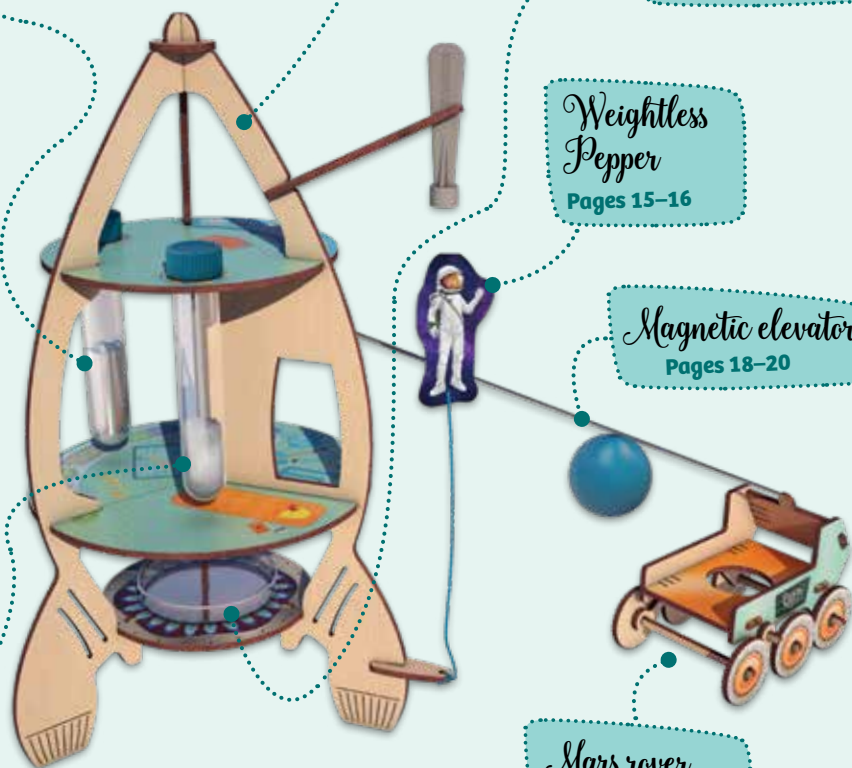
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Tip!

More background information can
be found on pages 10 and 25.





The Pants Button

Ever since Pepper had flipped through the brochure from the hardware store two weeks earlier, the dream of getting a new cordless screwdriver got her onto her bike everyday. According to her latest calculations, she would only have to spend another three afternoons delivering food on the bike until she had earned enough money, and her wish would finally come true.

Weighed down by a bag of sandwiches, she'd been heading out of town for about an hour, riding past stores and large warehouses, until she came to a huge gate in front of a closed compound with many buildings and domes.

"Hello, I'm Pepper Mint. Where should I deliver the food that was ordered?" she asked the young guard at the gate.

"At last!" he moaned and took a sandwich from the paper bag, which Pepper held out to him. "The rest have to go to Hall D, Aisle B12, Door 309. You have to turn left behind the building, then right twice, through the corridor on the left, two lefts, two rights, through Gate 2, go down the stairs, and finally twice left and through the third door on the right," said the guard, chewing.

Pepper did not hesitate and behind the building went once to the left, then twice right, down the hallway on the left, then left, left, right, right, through Gate 2, down the stairs, and finally two more lefts and through the third door on the left. While Pepper was still thinking about whether she had made a mistake at the last turn, she stepped through a large, heavy door with a colorful sign. She even had to press a red button and enter a four-digit code. "One, two, three, four was pretty easy to guess," Pepper thought as she entered the huge chamber beyond. Even stranger than the door, she could hear a low humming noise in the room and she suddenly felt a pull on her waistband. A moment later, her pants button was pulled off with a violent jolt and flew through the room as fast as lightning while a loud alarm went off above her head.



YOU WILL NEED ...

Wooden sheet,
plain

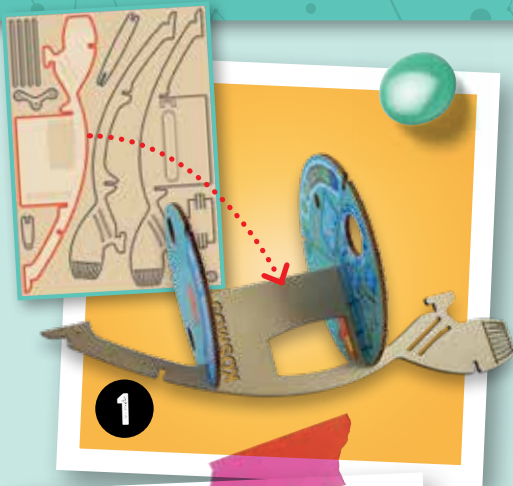


Cardboard sheet

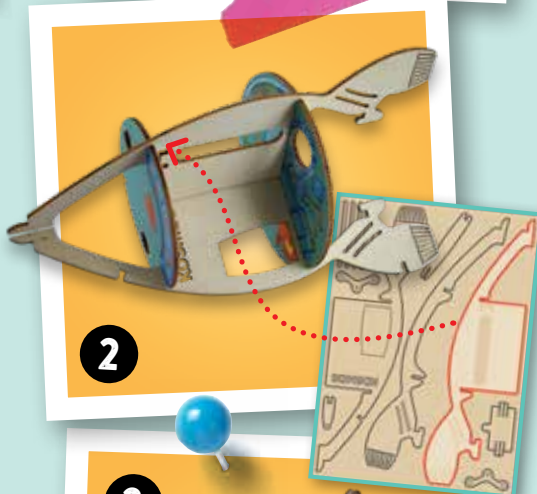


You will also need: Scissors

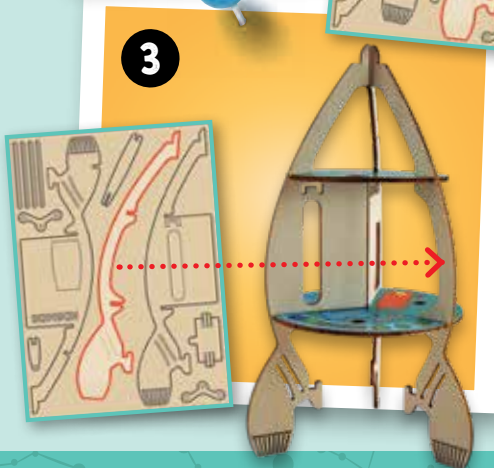
Wooden sheet,
printed



1



2



3

HERE'S HOW!

- 1 Carefully remove the side of the rocket marked "KOSMOS" from the wooden sheet. The rocket ship has three circular levels. Remove the large and medium rocket ship levels from the printed wooden sheet. Slide the top level piece (with the control room) into the top slot of the side piece. Likewise, attach the large middle level to the middle of the sidewall. Make sure that the round cutouts in the top level are exactly above the two smaller holes in the middle level.
- 2 Now, slide the second rocket side into the slots in the same two levels.
- 3 Finally, attach the last side wall by sliding it into the side slots of the top and middle level pieces.

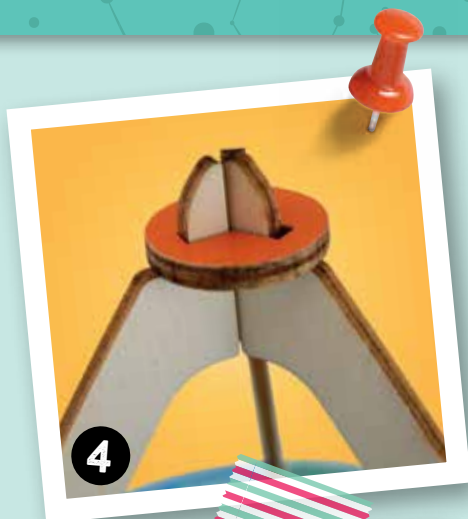
Tip!

If any parts catch, you can use the sandpaper to make the slots wider or the tabs narrower.

- 4 Stand your rocket up. Connect the three side walls at the top with the small disk.
- 5 Finally, attach the bottom level (with the rocket engine) by sliding it downward onto the tabs on the three sides from above. Now your Mars rocket is ready!
- 6 Cut the Pepper Mint figure out of the cardboard sheet and fold it over in the middle, so that Pepper can be seen from both sides. Next bend the semicircles at her feet outwards and position them adjacent to each other. Your figure can now board the finished rocket.



Place your Mars rocket on a stable surface where it will not be disturbed and does not have to be moved. To make the rocket more stable, you can glue the connections together with wood glue.



The Magnetic Whatever

After the alarm had finally faded away, a group of people in white coats and unusually thick glasses poured out of an adjoining room that Pepper had not noticed until then.

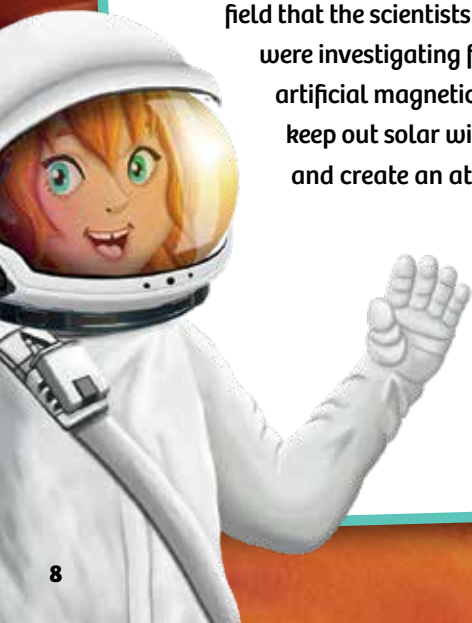
“Young lady, your intrusion has made the results of our measurements absolutely useless. Days of work are ruined!” ranted the tallest and the leanest of the group.

Pepper did not understand what had just happened and looked at her waistband. “Where has my button gone?” she asked in astonishment. At which point, the tall, lean woman shouted even more and shook her finger.

To relieve the situation, Pepper could do only one thing. “Does anyone want a sandwich?” she asked with a beaming smile, holding up her food delivery toward the furious woman. Less than ten minutes later, the last crumb was eaten and the leader of the nearsighted group finally told Pepper what had happened:

The unsuspecting girl had burst into the middle of an artificial magnetic field that the scientists at the research station had produced and were investigating for an important space mission. One day, an artificial magnetic field on the planet Mars would be able to keep out solar winds and radiation in order to collect water and create an atmosphere in which a human could survive.

Pepper’s jaw dropped. Although she had no idea what a magnetic whatever was, the scientist’s explanation was so incredible that she had to find out ...





YOU WILL NEED ...



Magnet



Test tube with iron filings



NOTE: The lid on the test tube containing the iron filings is tightly closed. Do not open it!

HERE'S HOW!

- 1 Place the test tube with the iron filings into one of the round holes in the upper level sliding it in from the top down. The bottom of the test tube rests on the middle level.
- 2 Take your magnet and bring it near the powder. What happens?
- 3 Move the magnet along the test tube changing the distance between the magnet and the test tube.

REMEMBER

We cannot perceive magnetism directly. We cannot feel, see, hear, smell, or even taste it. But we can make the forces that come from magnets visible. The small iron filings in the test tube are perfect for doing that.

Tip!

Search for more things around you that will attract your magnet!

WHAT'S HAPPENING?

The closer the magnet comes to the iron filings, the more the filings change their shape. What was initially a disorderly pile at the bottom, now forms a structure influenced by the magnet and its motion. If you get up really close to the test tube, you can even push the iron filings upward with the magnet, working against gravity.



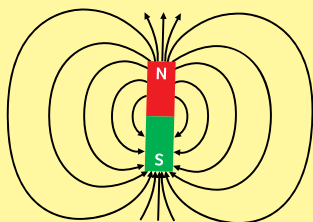


POLE

A magnet is always made up of a north AND a south pole. Normally the **north pole** is marked **red** and the **south pole** is **green or blue**. You can never have one without the other. Even if a magnet is broken in the middle, you will still have two complete magnets — each with a north and a south pole.

MAGNETIC FIELD

The iron filings in your experiment will align themselves along the magnetic field lines. These are the lines that show us the direction of the force. These always start at the north and end at the south pole and thus are closed. The denser these lines are, the stronger the force is at that point. The poles of the magnet are the two places where the force effect is greatest — that is, the field is densest.



MAGNETISM

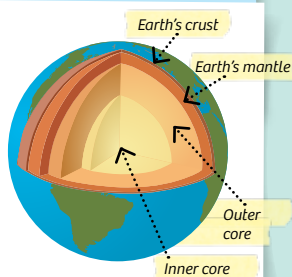
Of all the types of materials that exist in our world, very few of them are magnetic. Wood, glass, and plastic for example show no reactions when you put them close to a magnet. It looks a lot more promising with metals, although there are only a few that are magnetic: Iron, nickel, and cobalt are among the few pure materials that are magnetic, even at room temperature. But there are many other material combinations (for example, alloys) that contain these metals and are also magnetic.

EARTH'S MAGNETIC FIELD

Our planet has its own magnetic field, which is similar to that of a huge bar magnet. This magnetic field partially protects Earth against radiation from the universe and is very important for life on Earth. What is confusing is that the magnetic south pole of the Earth is not in the south, but in the north and vice versa. The individual poles do not align exactly, but are slightly offset from each other. Over the course of Earth's history, there have been frequent reversals of its magnetic field. Even now, a shift of the magnetic poles can be observed.

WHY DOES EARTH HAVE A MAGNETIC FIELD?

Earth's magnetic field exists because of the structure of the planet. Earth is made up of an inner and outer core. Above those are the Earth's mantle and the Earth's crust. The outer part of the Earth's core is made up of liquid iron and nickel, while the inner core is solid. Masses of this molten metal in the outer layer of the core are circulating around. This generates electric currents and magnetic fields — the Earth's magnetic field.



The Secret Mission

The next morning, Pepper again stood in front of the entrance to the research facility's grounds. To make up for the botched experiment, she had offered to help the scientists with their work for the next two weeks and find out what magnetism was all about.

The guard accepted her promotion from food delivery girl to space explorer with a shrug of his shoulders, and Pepper went behind the building and once to the left, then twice right, through the hallway on the left, then left twice, right twice, through Gate 2, down the stairs, and finally left twice and through the fourth door on the left.

"Darn it, I have taken a wrong turn again," thought Pepper, as she stepped into an empty office. This time she was not magically attracted by an enormous magnet, but rather, by a single file lying on the desk which was stamped "Top Secret!"

Even before she could have a guilty conscience, Pepper opened the file and scanned the pages.

"Well, well ... in a few days, a space mission to Mars will take off," whispered Pepper excitedly. If the door had not opened at that moment, Pepper would have studied every page of the secret file.

"Oh, have you taken a wrong turn again Pepper?" asked Pepper's new boss, who had just come in. The girl nodded innocently, discreetly placing the file back on the desk and following the researcher to the station.

On the way back, Pepper had a great idea: In order to stop getting lost on the grounds, she would build a compass tonight! The magnet in the compass would not point to the north, but to the artificial magnetic field, where the team was secretly preparing for a mission to Mars ...



YOU WILL NEED ...

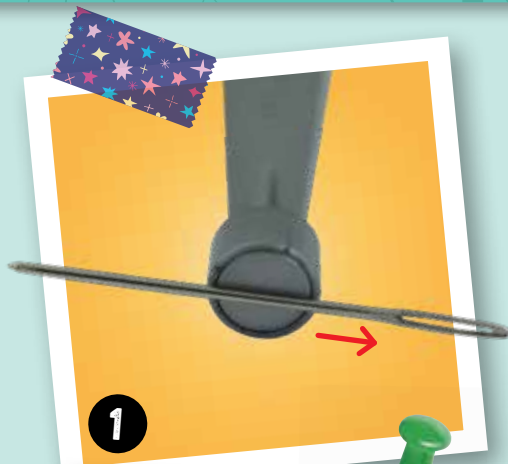


You will also need: Tap water, sticky tape, scissors

HERE'S HOW!

Can you build a compass out of water, a foam disk, and a needle? Find out:

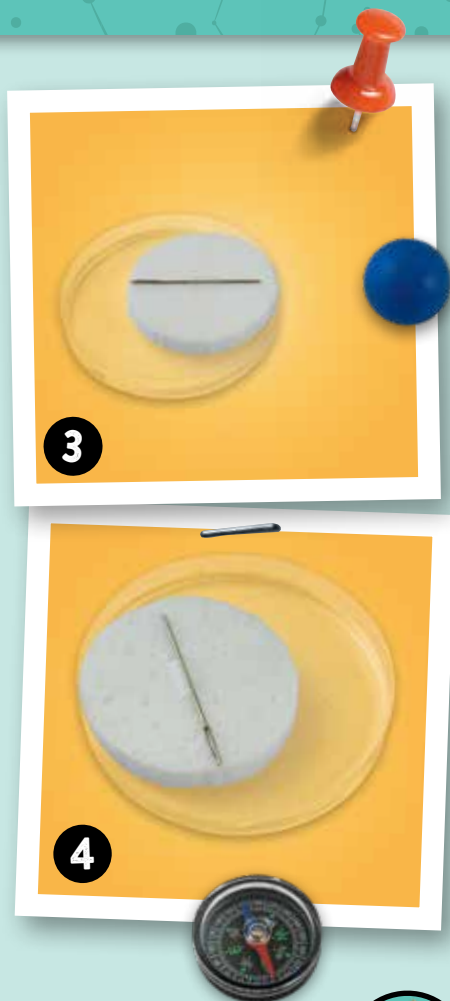
- 1 Hold your needle against a metallic object. It won't behave like a magnet. To build a compass, you first need to magnetize your needle: To do this, rub the needle 60–70 times along the underside of the magnet. Make sure you always move the needle over the magnet in the same direction.
- 2 Then attach the needle onto the polystyrene foam disk using a strip of sticky tape. Next, fill the petri dish halfway with tap water and place the disk in the water.



- 3 With that, your homemade compass is now fully functional. Bring the magnetic ball close to the needle and together with the polystyrene disk, it will rotate either away from the pole or toward the pole. If you remove the magnetic ball from near the needle, the floating disk rotates until it comes to a stop. If necessary, nudge it away from the edge of the petri dish into the middle.
- 4 The needle on the floating polystyrene disk aligns along the north-south axis of the Earth's magnetic field. You can check where the pole is with your compass. Place it a short distance away from the petri dish and turn the compass until the red arrow points north ("N"). Now you can determine the cardinal points (North, South, East, West) and know where the tip of your needle is pointing.

Tip!

You can keep the petri dish on the lowest level of your rocket!



WHAT'S HAPPENING?

Rubbing your needle on the magnet magnetizes it. Within your iron needle are many tiny areas that are like small magnets in themselves. You can think of this magnetism like a small arrow that, at the beginning, points in every direction so all the forces cancel each other out. By rubbing the magnet in a certain direction, the arrows point in the same direction. The individual forces add up and create a magnetization that is strong enough to align the needle along the Earth's magnetic field.



Floating Pepper

Over the next few days, Pepper watched all of the operations in the station closely as she made coffee, copied files, and dropped off letters. But nothing seemed to show that in a few days, a rocket to Mars would launch. If there was anything at all that was different, it was that the work in the station had become even more monotonous.

Only on the second to last day of her internship did Pepper overhear a conversation that the station leader was having with a young man. Even though they were whispering, Pepper was able to pick out a few interesting phrases: "... start as discussed ...," "... conditions on Mars ...," and "... rocket is ready in Hall D...," she could hear from the whisper.

Right away a plan came together in Pepper's mind. She would say goodbye to the team and sneak into that hall on the way to the exit. When else would she have the opportunity to check out a real space rocket? Maybe even from the inside ...

This time, Pepper found the right way immediately. Hall D was a cavernous space that stretched high above her. It was almost entirely filled by a huge white capsule whose top Pepper could not see from the ground. Pepper climbed up a tall ladder and through a hatch into a small room full of cables and hoses.

Curiosity drove Pepper further up until she finally found herself in a room full of monitors and buttons. As Pepper turned around, she saw three scientists who were sitting in their spacesuits, strapped into their seats in front of her. Her heart sank almost down to her boots. There was a tremendous noise, the rocket began to vibrate, and Pepper lost her balance. Only a few moments later, she was floating helplessly around the room.



YOU WILL NEED ...



Cardboard
sheet



Wooden sheet,
natural

1x Paper clip



String

Needle



Magnet



You will also need: Craft glue, scissors

HERE'S HOW!

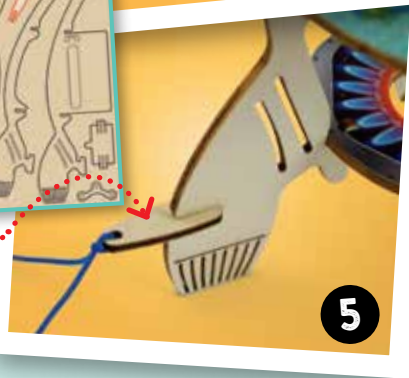
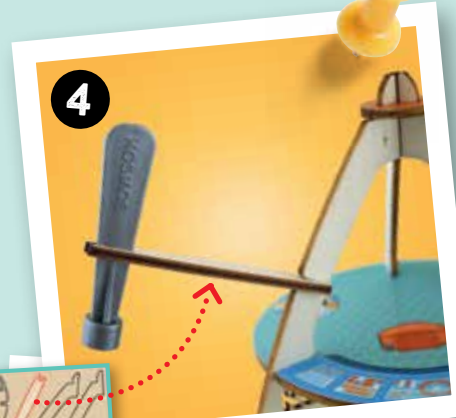
- 1 Cut out one of the two figures from the sheet and place it in front of you with the colored side facing down. Coat the paper surface with craft glue. Place the paper clip as shown in the picture. Make sure that the paper clip rests against the top edge and does not slip while you are working.
- 2 Fold the top half to the bottom and glue both edges together so that the paper clip is completely enclosed within the paper.
- 3 Carefully pierce the pre-marked hole in Pepper's feet using the needle and thread the string through the hole.
- 4 Attach the wooden holder and the magnet to the top of the rocket.



3



- 5 Tie the string with a knot to the small bracket that you affix to the foot of the rocket.
- 6 Now you have to try something: Move your astronaut closer and closer to the magnet along the string. Once you are just a finger's width from the magnet, you can let go of Pepper. If the line is stretched and the distance to the magnet is right, Pepper will float in mid-air!



WHAT'S HAPPENING?



The paper clip that you have hidden inside your astronaut's body is attracted by the magnet. It wants to get closer to the magnet while the taut string keeps it in place. At the point of "weightlessness," the magnet's attractive force compensates for gravity. As soon as the magnet is too far away, gravity will cause the paper clip, and the astronaut, to fall down.

Welcome to Mars

After the initial shock of her weightlessness, Pepper quickly began to accept the gravity of the situation: She was part of the secret Mars mission! What an amazing adventure!

The three other members of their space crew had a harder time accepting the new situation. For the second time in her internship, Pepper bore the brunt of the rants of the magnetic field scientists. But in the end, the team had no choice but to accept Pepper's presence and put her in a spacesuit.

After Pepper was dressed, Jonas, one of the scientists, told Pepper the plan: Two powerful magnets would be placed on the surface of Mars using a remote-controlled vehicle. The aim of the mission was to practice the installation and construction of a small magnetic field on Mars.

As soon as the most important details were discussed and the tasks assigned, the alarm sounded and indicated to the crew that the rocket had reached its target position. With a slight shake, the rocket's engine stopped and the large monitor revealed a jagged, dusty surface. Now the mission could begin: The Mars rover was lowered down from the rocket by remote-controlled machines and loaded with cargo. Pepper peered over the shoulders of the astronauts at the controls, while they worked hard to operate them. The control stick reminded her a lot of her gaming consoles back home. She was sure that she could do the launching and loading of the Mars rover a lot faster and more skillfully than her three fellow travelers — Pepper had to intervene!





YOU WILL NEED ...

Wooden sheet,
natural



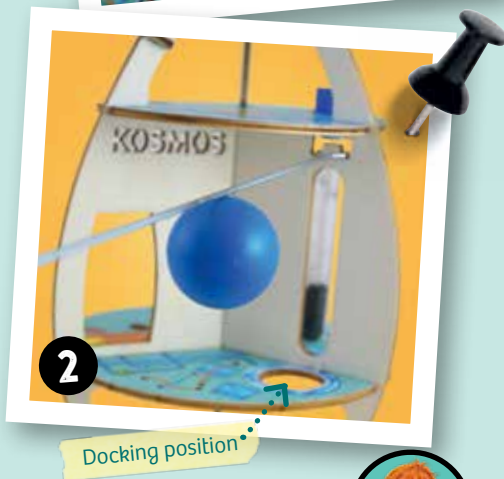
Wooden sheet,
printed



Magnetic
ball



Metal wire



HERE'S HOW!

- 1 Hang the metal wire on the tab inside the rocket.
- 2 Hold the other end of the wire up with your hand so that the wire is horizontal and hang the magnetic ball on it. Lower the end and watch what happens. Then dock your magnetic ball in the hole under the metal wire.

WHAT'S HAPPENING?

The ball will stick to the underside of the wire and slide down the wire if you hold it at an angle. The same part of it remains in contact with the metal wire.

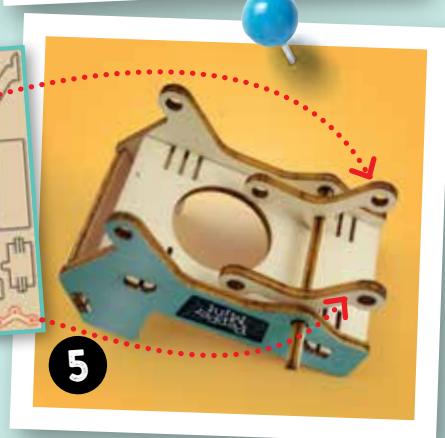
Can you flip the wire over and still attach the ball to it? This works! If the wire itself was a permanent magnet, it would not work on both sides. In this case, each magnet would have its fixed poles and depending on whether you held equal or unequal poles together, they would repel or attract each other. The piece of wire, however, has no fixed poles, but adapts to the respective polar orientation of the magnet. Thus, the forces of attraction always work for both orientations.



- 3 Now you can put your Mars rover together. Carefully remove the cargo area, the front piece, and the side panels from the two wooden sheets. Insert the cargo area and the front piece into the slots of one side panel from the side.
- 4 Next, hook in the second side panel from the other side.
- 5 Gather the four axles and turn the rover upside down. On the rear axle, thread the suspension pieces onto both sides on the axle, between the two side panels of the rover.

Tip!

Watch out: The axles are not round, but rather have flat sides. You have to turn them around the right way to fit through the suspension and through the wheels.



Axes



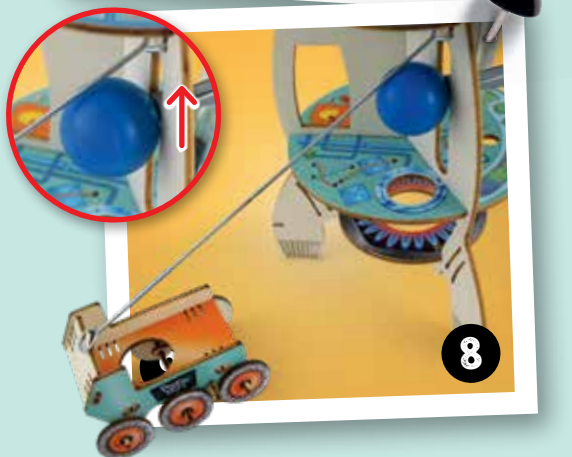
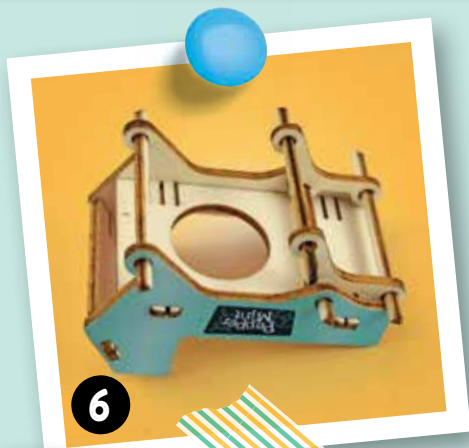


- 6 Now you can push two more axles through the front and back of the suspension assembly. Add the fourth axle at the front.
- 7 Put the wheels on the three lower axles from both sides.
- 8 Turn your rover over and hook the free tab of the metal wire to the top of the front piece. The cargo area points to the rocket.

Now you need to be really careful: Using the magnet with the gray handle, guide the magnetic ball from the rover back up to the wire. If the magnetic ball hangs on the wire with the opposite pole, you can carefully pull the magnet with the gray handle away and the ball will slide down the metal wire and land in the Mars rover.

Tip!

Hold the rocket at the top or hold the end of the wire onto the Mars rover, to keep everything stable. You will need a little practice until you get it right. But don't give up!





YOU WILL NEED ...



Mars rover



Magnetic ball

Magnet

HERE'S HOW!

- 1 Align the magnetic ball on the cargo bay of your rover so that the magnetic poles point backward and forward.
- 2 Using your magnet, approach the ball from the back or the front. Try to move the Mars rover. Experiment with the magnets: Change direction and alternate between moving slowly and quickly towards the ball.
- 3 Try to overcome small obstacles on the way, such as a magazine or comic book.



WHAT'S HAPPENING?

If you take two magnets and hold them together, you will find that the same poles repel each other while different poles attract each other.



Attractive force



Repulsive force



Repulsive force

In this way, you can either push your Mars rover in front of you or pull it along with you, depending on the orientation of the magnet.



In the Rocket Simulator

A short announcement from the speaker brought Pepper's space career to a sudden end. "Bravo! Despite having a stowaway, you dealt with the exercise well! You can now leave the rocket simulator."

"Simulator?" Pepper repeated in disbelief. "Does that mean we didn't land on Mars?" Looking into the laughing faces of the others, Pepper's dream finally burst.

"What did you think? It takes 18 months to reach Mars in a rocket," explained Jonas, "and so far, there hasn't been a manned flight there yet."

Now, Pepper joined in the laughter. The flight had actually been very short and the image on the monitor did look a lot like the grounds behind the research facility. Their mission to Mars was in reality a training mission in a giant machine that had just recreated the conditions inside a space rocket.

"You still did very well Pepper!" said Jonas trying to cheer her up, "You did best with the controls."

And with that compliment, Pepper left the rocket simulator and inwardly prepared herself for the third lecture from her boss that she would have to listen to. Now she would probably have to spend the last day of her internship cleaning the lab. Well, maybe there is something exciting to discover there ...





YOU WILL NEED ...



1x Paper clip



Magnet



Test tube with lid



Slime powder

You will also need: Scissors, kitchen knife, tap water, and possibly kitchen scales

HERE'S HOW!

- 1 Cut open a corner of the bag of slime powder with the scissors. Make sure that the label remains readable and that you do not get the powder in your eyes, nose, or mouth.
- 2 Fill the test tube halfway with tap water.
- 3 Add a knife tip of the slime powder and put it in the tube with the water. You need about 3 grams, in case you prefer to measure it. The opened packet can be folded over at the open corner and then closed with a paper clip.
- 4 Put the lid on the tube and shake vigorously for about one minute. Then place the tube in your rocket and wait ten minutes until the mass becomes thick. Every so often, shake the tube again to help the slime solidify.
- 5 Move your magnet towards the slime mass. What happens?

Approx. 3 g slime powder

3

4



Pepper
Mint

AND THE Magnetic Slime

Tip!

Your slime contains no harmful preservatives and therefore lasts only a few days. Dispose of the residues in the household trash and rinse the test tube with hot water. The remaining powder can be used for further experiments or mixed with 75 ml of water in a small plastic bottle. The finished slime can be stored in your closed petri dish.

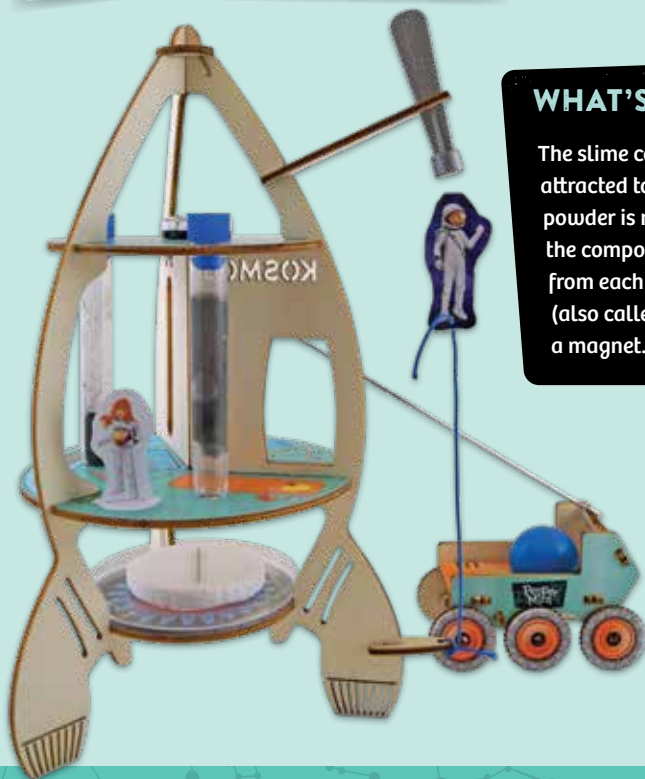


The slime can leave stains on clothes, furniture, or sensitive surfaces. Wash your hands after experimenting!

WHAT'S HAPPENING?



The slime contains iron powder, which is attracted to the magnet. As the iron powder is mixed in with the slime and the components are barely separated from each other, the whole mixture (also called a dispersion) is attracted to a magnet.



Now your Mars rocket is fully equipped! Have fun experimenting and playing!



STEM SUPERSTARS

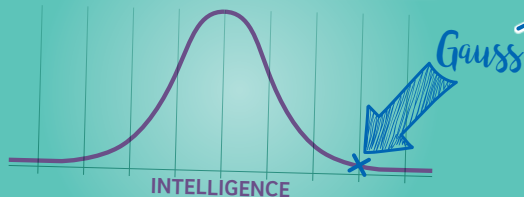
VALENTINA TERESHKOVA

- Once said: "I dreamed of traveling to the stars as a child. If needed I would have flown on a broomstick."
- Born in a small village in Russia in 1937
- She made history in 1963 as the first woman in space
- Her space career began with parachuting; before that she had trained to be a seamstress

• After her, 60 women have traveled into space!



CARL FRIEDRICH GAUSS



• Once said: "One should not confuse that which seems to us to be improbable and unnatural with that which is absolutely impossible."

• Was born in Brunswick in 1777 and joked that he learned to speak after learning arithmetic

• Was a mathematician, physicist, and geodesist

• He worked on the measuring and mapping of the Earth's surface



Gauss worked together with the naturalist Alexander von Humboldt and, based on that work, later published an "Atlas of the Earth's Magnetism."

Did you know?

Have you ever wondered why so many famous physicists of the past were men, and only a few were women? It was because of the strict rules of society back then. Valentina Tereshkova was sent as the first woman into space as a propaganda stunt for her country. After that it took more than two decades for another female Russian astronaut to travel into space. Fortunately, things have changed a lot in the last few decades. Today, women can choose to become whatever they want to be ...

It was really fun to have shared this adventure with you! I hope you'd like to have many more. Bye!





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