

STEM EXPERIMENT KIT™

EN

Manual

Bouncing Planets

WARNING — This set contains chemicals [and/or parts] that may be harmful if misused. Read cautions on individual containers [and in manual] carefully. Not to be used by children except under adult supervision.

WARNING. Not suitable for children under 8 years. For use under adult supervision. Read the instructions before use, follow them and keep them for reference.

EN Advice for supervising adults

Please lend your child a hand and assist and supervise them when carrying out the experiments. Before starting the experiment, read through the instructions together and follow all the steps. Keep all parts of the kit out of reach of small children. Only carry out those experiments that are described in the instructions for use. This experimentation kit is only suitable for children over 8.



WARNING. Not suitable for children under 3 years. Choking hazard — small parts and small balls may be swallowed or inhaled.

Only use under adult supervision. Keep the experimentation kit, the packets of granular material and the finished bouncy balls out of reach of children under 8 and animals.

Notes on the polymer granules: Colored granules (99.4% polyvinyl alcohol, propylene glycol, E219, pigment), 5 packets of 10 g each. Do not ingest. Dispose of empty packets and other residues in the household trash.

The area around the experiments should be free of any obstacles and away from where food is stored. It should be well-lit and well-ventilated and should have water available. A solid table covered with newspaper should be provided. Clean the work space immediately after carrying out the experiments.

Wash all equipment used after use and wash hands thoroughly after experimenting. Wash any household materials used in the experiment thoroughly before using them again.

The packets of granular material should be (fully) used up during an experiment, i.e. once the packaging has been opened. Make sure you do not get any in your eyes when experimenting. Do not inhale or swallow the granular material and granular material powder. Do not produce dust when working with the granular material — do not rush and be calm.

Do not eat or drink anything in the experimentation area. The colorful granular material has a very powerful dyeing ability and can stain clothes with stains that don't wash out. For this reason, wear old clothes when experimenting and remove tablecloths or rugs from the experimentation area. Have fun experimenting!

Experiment 1

1. Assemble the ball mold halves and choose a granular material color. Open the packet using scissors. Pour some granular material into the mold.
2. Lightly shake the mold and carefully tap it on the tabletop so that the granular material settles.
3. Fill the mold with your chosen granular material color layer by layer up to the filling line shown.



4. Pour warm water into the cup included in this kit.
5. Now immerse the ball mold in the water. It needs to be completely immersed. Move the mold around in the water a bit.
6. Leave the mold to stand in the water for two minutes.
7. Take the mold out of the water and leave it for three minutes.
8. You can then carefully open it and retrieve your first rubbery, bouncing planet, which is still a bit sticky. It is best to let it dry for a bit longer.



What's happening?

The bouncy ball granules are mostly composed of polyvinyl alcohol (PVA), which is a water-soluble polymer with elastic properties. Polymers are long, tangled chains of carbon, hydrogen, and oxygen atoms. When the granules are moistened, their surfaces start to dissolve slowly, they swell up a little, and they become sticky. The long polymers get tangled up in each other. In this way, the granules stick together inside the mold.

The balls are bouncy because the PVA material is elastic, which means it springs back to its original shape after being compressed or stretched. This elastic property comes from the shapes of the polymer chains.

Experiment 2

1. Scatter some of the granular material around the edge of the petri dish.
2. Using the pipette, push the scattered granular material to the edge or form a smaller ring in the center.
3. Now drip the warm water from the pipette over the granular material and then leave it to dry for a few hours.
4. Carefully remove your ring from the dish and place it around your planet, like the rings of Saturn!

TIP! Use the finished planets to create a solar system mobile for your room.



IMPORTANT!

Your bouncy balls do not contain any additives to keep them soft forever. After a few days, they will dry out and lose their elasticity!

©2018 Franckh-Kosmos Verlags-GmbH & Co. KG, Pfizerstrasse 5–7, 70184 Stuttgart, Germany

This work, including all its parts, is copyright protected. Any use outside the specific limits of the copyright law is prohibited and punishable by law without the consent of the publisher. This applies specifically to reproductions, translations, microfilming, and storage and processing in electronic systems and networks. We do not guarantee that all material in this work is free from other copyright or other protection.

Project manager: L. Bergsträsser, A. Büchele Composition: sloedesign.de, M. Horn • Illustrations/Photos: Michael Flaig, Pro-Studios; © Thames & Kosmos, LLC, Providence, RI, USA

1st North American Edition © 2020 Thames & Kosmos, LLC, Providence, RI, USA
Thames & Kosmos® is a registered trademark of Thames & Kosmos, LLC.
Editing: Ted McGuire; Additional Graphics and Layout: Dan Freitas

Distributed in North America by Thames & Kosmos, LLC, Providence, RI 02903
Phone: 800-587-2872; Web: www.thamesandkosmos.com

We reserve the right to make technical changes.

Printed in Taiwan

