

Alannah and the Material Mix-Up

A magical adventure about the properties of materials

AN ALANNAH DIOR LEARNING ADVENTURE



The Great Mix-Up

Alannah arrived at the Maker Market just as the Material Mixer sneezed out rainbow sparks. Suddenly, a sponge umbrella dripped, cardboard wheels bent, and a stiff metal blanket stood straight up! Patch, the little maker robot, beeped, “Every invention has the wrong material!” Alannah opened her testing kit. “Then we will discover what each material can do.”



Hard, Strong, Soft, and Cozy

Alannah pressed a wooden block. It was hard and strong, so she chose wood for a bridge. Then she squeezed a fluffy fabric cushion. It was soft and comfortable, so she chose fabric for a seat. Patch rolled safely across the bridge carrying the cozy cushion. “Different jobs need different properties,” Alannah said.



The Texture Track

Two toy carts waited on two ramps. The smooth metal ramp let one cart glide quickly. The rough ramp rubbed against the other cart and slowed it down. “Rough surfaces create more friction,” Alannah noticed. She used a smooth track for rolling and a rough mat for stopping.



Bendy or Stiff?

Alannah curved a rubber strip without breaking it. “Rubber is flexible,” she said. A wooden stick stayed straight. “Wood is rigid.” She used bendy rubber for a safety bumper and rigid wood for a strong kite frame. Patch held the kite while Alannah tied the final knot.



Rain-Test Rescue

Gentle rain poured over two little shelters. Water rolled off the waterproof yellow fabric, keeping Patch dry. A sponge roof soaked up the water and became heavy. “Waterproof materials keep water out,” Alannah said. “Absorbent materials soak it in.” She chose fabric for the umbrella and a sponge for cleaning puddles.



Let the Light Through

Alannah could see Patch clearly through a transparent glass pane because light passed through it. An opaque wooden panel blocked the view and made a shadow. She used clear glass for a window and opaque wood for a privacy door. “Some materials let light through, and others do not,” she explained.



Magnet Detective

Alannah held a magnet above the sorting table. Steel clips, bolts, and a metal wheel jumped toward it. Wood, rubber, fabric, glass, and plastic stayed still. “Magnets attract some metals, but not every material,” she said. Patch used the magnet to make a handy tool holder.



The Maker Market Shines

Alannah and Patch revealed the repaired market: a strong bridge, soft seat, smooth rolling track, rough stopping mat, flexible bumper, rigid kite frame, waterproof umbrella, absorbent sponge, clear window, opaque door, and magnetic tool rack. The crowd cheered. Alannah smiled. “A material is useful when its properties match the job!”

After the Story

Talk, compare, test, and create!

1. Why was wood a good choice for the bridge?
2. How did the rough ramp change the cart's motion?
3. What is the difference between flexible and rigid?
4. Which material was waterproof, and which was absorbent?
5. Why could Alannah see through glass but not through wood?

Material detective

Find three safe objects. Describe each as hard or soft, rough or smooth, flexible or rigid.

Design challenge

Draw a new invention. Which materials will you use, and which properties make them right for the job?