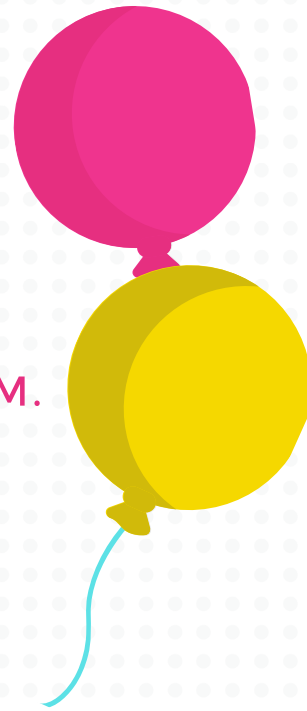


BALLOON ROCKET CHALLENGE



IN THIS MAKERSPACE CHALLENGE, YOU WILL HAVE TO CREATE A ROCKET OUT OF SIMPLE MATERIALS THAT CAN TRAVEL ACROSS A ROOM.

Supplies:

- ONE BALLOON
- ONE STRAW
- TAPE
- SCISSORS
- 20 FEET OF STRING
- ONE CLOTHESPIN
- TIMER

THE CHALLENGE:

STEP 1: GET OUT ALL OF YOUR SUPPLIES

STEP 2: REVIEW THE GUIDELINES BELOW.

- USING YOUR BALLOON, STRAW, TAPE, SCISSORS, STRING, AND CLOTHESPIN, YOU MUST CREATE A ROCKET THAT WILL TRAVEL A DISTANCE OF AT LEAST 15 FEET.
- YOU ARE ALLOWED TO CUT AND TAPE YOUR OBJECTS.
- YOU WILL BE GIVEN 15 MINUTES FOR THIS CHALLENGE.

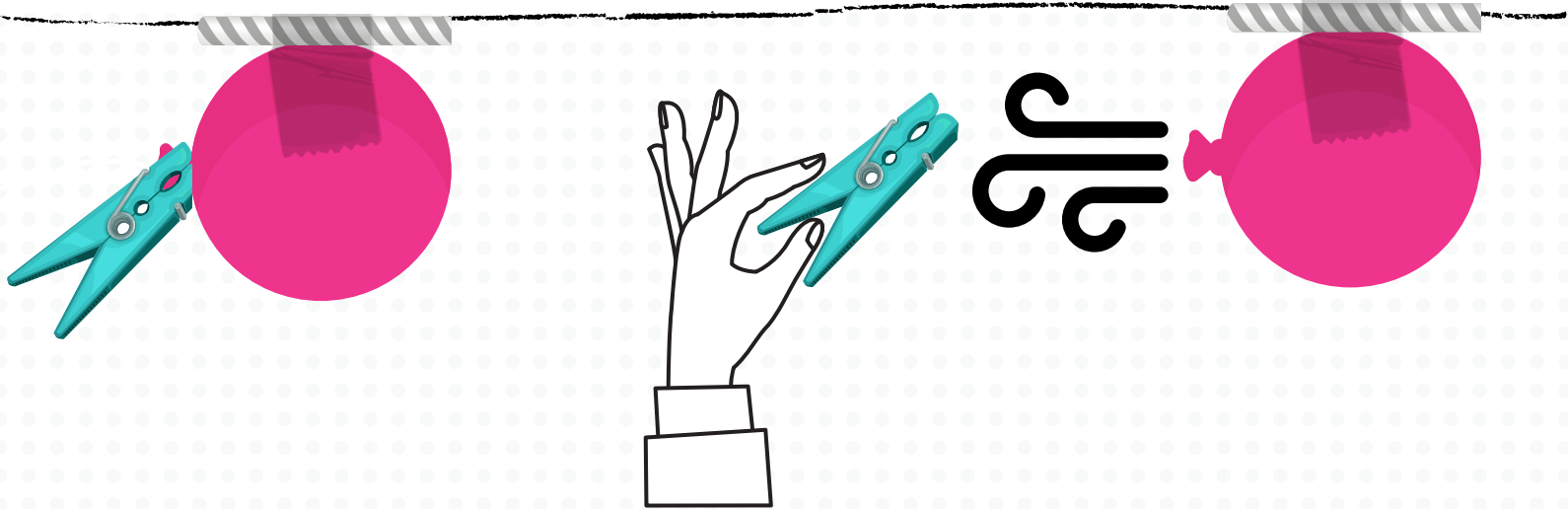
STEP 3: SET YOUR TIMER FOR 15 MINUTES, GET SET, AND...

STEP 4: CREATE! GOOD LUCK!

STEP 5: AFTER YOUR TIME IS UP, LOOK TO THE NEXT PAGE FOR THE SOLUTION.

DO NOT LOOK AT THE NEXT PAGE UNTIL YOU HAVE ATTEMPTED THE CHALLENGE. ONLY SCROLL DOWN/FLIP THE PAGE IF YOU WANT TO SEE THE SOLUTION.

SOLUTION



USE SCISSORS TO CUT YOUR STRAW IN HALF. PULL YOUR STRING THROUGH THE HOLE OF YOUR STRAW PIECE. RUN YOUR STRING FROM ONE SIDE OF THE ROOM TO THE OTHER AND SECURE EACH END IN PLACE BY TYING YOUR STRING OR TAPING IT. NEXT, INFLATE YOUR BALLOON AND TAPE YOUR FULL BALLOON TO THE BOTTOM SIDE OF YOUR STRAW PIECE. YOU MAY USE THE CLOTHESPIN TO CLOSE THE OPEN END OF YOUR BALLOON AND KEEP THE AIR INSIDE. WHEN YOU ARE READY TO SEND YOUR ROCKET FLYING, RELEASE THE CLOTHESPIN!

REVIEW:

- DID YOU SUCCEED IN BUILDING A ROCKET THAT MADE IT ACROSS THE ROOM?
- HOW DID YOUR DESIGN COMPARE TO THE ONE ABOVE?
- IF YOU WERE TO REPEAT THIS EXPERIMENT, WOULD YOU DO ANYTHING DIFFERENTLY?
- HOW MUCH TIME DID YOU SPEND PLANNING AND HOW MUCH TIME DID YOU SPEND BUILDING? DID YOU TEST YOUR DESIGN MORE THAN ONCE?

HOW DOES THE ROCKET WORK?

NEWTON'S THIRD LAW OF MOTION STATES THAT "FOR EVERY ACTION, THERE IS AN EQUAL AND OPPOSITE REACTION." THAT MEANS THAT WHEN AIR ESCAPES WITH FORCE FROM THE OPEN END OF THE BALLOON AND TRAVELS BACKWARD, IT THRUSTS THE BALLOON FORWARD WITH THE SAME AMOUNT OF FORCE. SOME OF THIS FORCE IS LOST TO FRICTION, RESISTANCE OBJECTS FACE WHEN RUBBING AGAINST ONE ANOTHER. THE STRAW, BEING SO SMOOTH AGAINST THE STRING, HELPS REDUCE FRICTION. WITH LESS FORCE BEING TRANSFORMED INTO FRICTION, MORE CAN BE TRANSLATED INTO THRUST. SOME FORCE IS ALSO TRANSFORMED TO DRAG, WHICH HAPPENS WHEN AIR INTERACTS WITH A SOLID.

