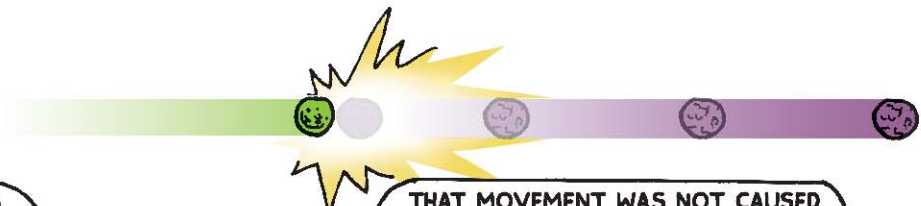




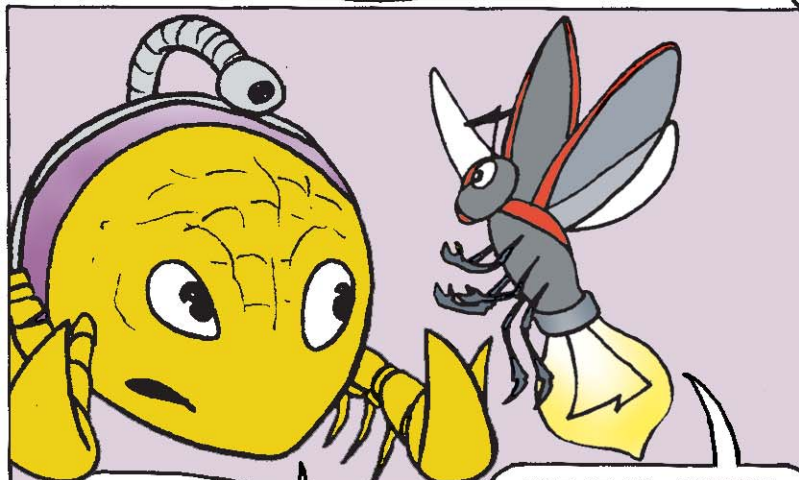
I JUST DISCOVERED SOMETHING MAGICAL, ANTE... WATCH THIS!



IT'S SO COOL... I HAVE MAGIC MARBLES!



THAT MOVEMENT WAS NOT CAUSED BY MAGIC SCORPY. IT WAS CAUSED BY A FORM OF MOTION. I THINK IT MAY BE TIME THAT YOU LEARNED ABOUT THE THREE LAWS OF MOTION.



LAWS OF MOTION?? DID I BREAK THE LAW WITH MY MARBLES??



NOT AT ALL, SCORPY! THE LAWS OF MOTION ARE THREE BASIC IDEAS ABOUT HOW THINGS MOVE.



LET'S START IN THIS SCIENCE BOOK AND SEE WHAT WE CAN DISCOVER ABOUT WHY AND HOW THINGS ARE MADE TO MOVE.

IN OTHER WORDS... WE NEED TO GET A MOVE ON IN LEARNING ABOUT MOVING ON!

WHO IS THAT GUY?
IS HE THE LAWYER
FOR THE THREE
LAWS OF MOTION??



HE IS NOT A LAWYER
SCORPY! REMEMBER THAT
THE THREE LAWS OF MOTION
ARE ACTUALLY THREE IDEAS
ABOUT MOTION. THIS
MAN IS ISAAC NEWTON AND
HE IS THE SCIENTIST THAT
CAME UP WITH THE THREE
IDEAS ABOUT MOTION.

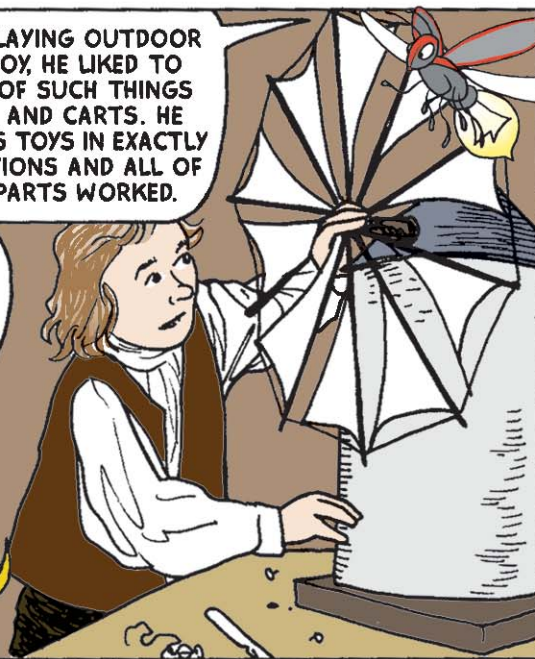
ISAAC NEWTON WAS BORN IN
ENGLAND ON CHRISTMAS DAY, 1642.
HE WAS A VERY SICK BABY AND MANY
DID NOT THINK HE WOULD SURVIVE.
HOWEVER, HE GOT BETTER AND
BEGAN TO GROW.

THAT'S GOOD
TO HEAR!



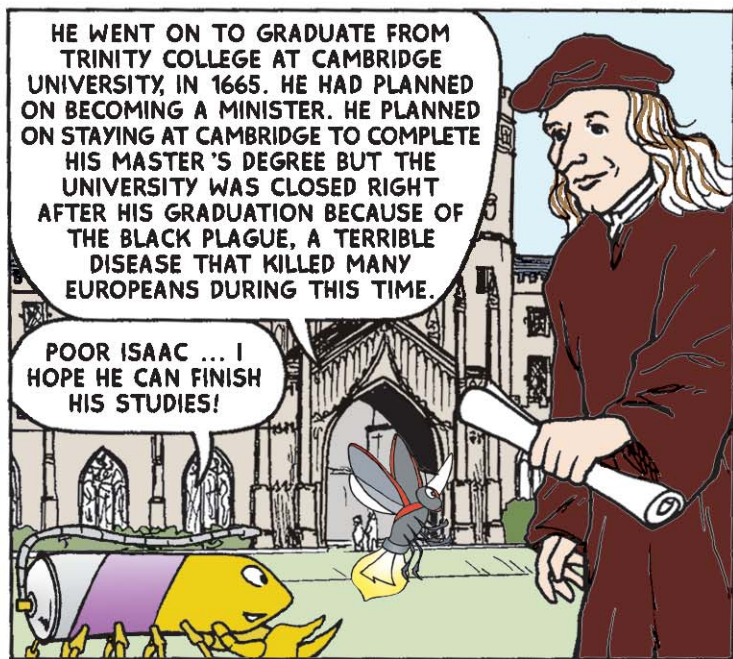
RATHER THAN PLAYING OUTDOOR
GAMES AS A BOY, HE LIKED TO
MAKE MODELS OF SUCH THINGS
AS WINDMILLS AND CARTS. HE
ALWAYS MADE HIS TOYS IN EXACTLY
RIGHT PROPORTIONS AND ALL OF
THE MOVING PARTS WORKED.

EVEN AT SUCH
AN EARLY AGE,
ISAAC WAS
CURIOUS ABOUT
HOW THINGS
MOVE!

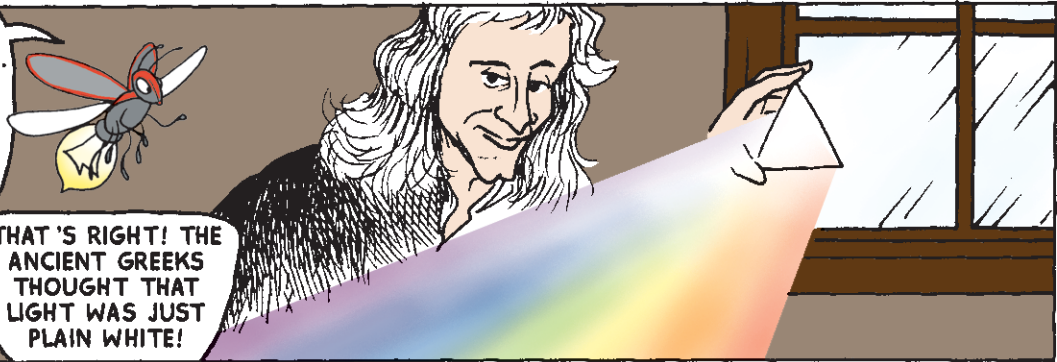


HE WENT ON TO GRADUATE FROM
TRINITY COLLEGE AT CAMBRIDGE
UNIVERSITY, IN 1665. HE HAD PLANNED
ON BECOMING A MINISTER. HE PLANNED
ON STAYING AT CAMBRIDGE TO COMPLETE
HIS MASTER'S DEGREE BUT THE
UNIVERSITY WAS CLOSED RIGHT
AFTER HIS GRADUATION BECAUSE OF
THE BLACK PLAGUE, A TERRIBLE
DISEASE THAT KILLED MANY
EUROPEANS DURING THIS TIME.

POOR ISAAC ... I
HOPE HE CAN FINISH
HIS STUDIES!

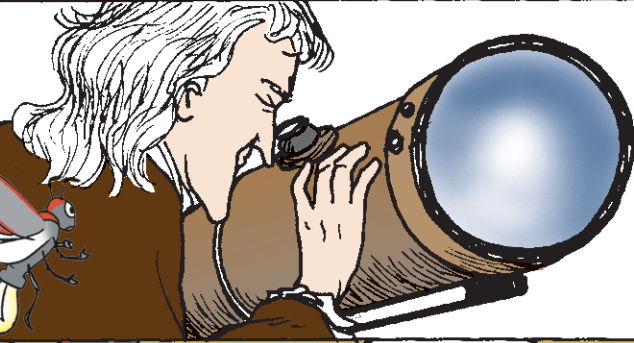


ISAAC NEWTON RETURNED TO COLLEGE TO COMPLETE HIS EDUCATION. HE ALSO BEGAN TO TEACH. HE USED PRISMS TO SHOW THAT SUNLIGHT WAS CONTAINED ALL THE COLORS OF THE RAINBOW. THIS PROVED THAT THE ANCIENT GREEKS' IDEAS ABOUT LIGHT WERE INCORRECT.



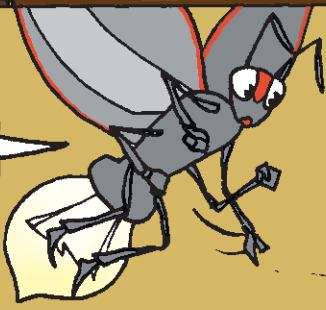
THAT'S RIGHT! THE ANCIENT GREEKS THOUGHT THAT LIGHT WAS JUST PLAIN WHITE!

NEWTON ALSO SUCCESSFULLY BUILT A TELESCOPE USING A CURVED MIRROR. THIS ALLOWED THE OBSERVER TO SEE A MUCH CLEARER IMAGE BY REFLECTING THE LIGHT. THIS PRACTICE IS STILL IN USE TODAY!

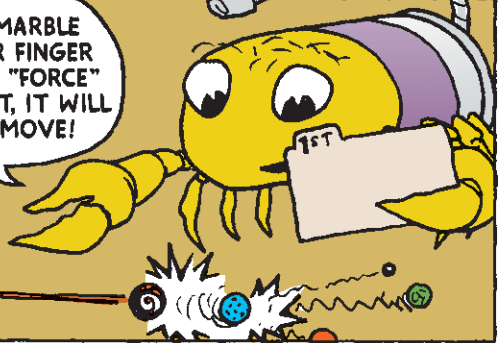


I'M READY TO LAY DOWN THE LAW ... NEWTON'S LAW THAT IS!!

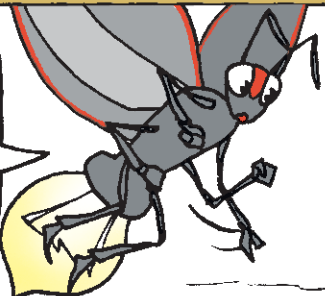
NEWTON'S FIRST LAW IS SOMETIMES CALLED THE "LAW OF INERTIA." THE FIRST PART STATES: "AN OBJECT IN MOTION WILL REMAIN IN MOTION UNTIL A FORCE ACTS ON IT." FOR EXAMPLE, THIS MARBLE WILL NOT MOVE UNLESS AN OUTSIDE FORCE, LIKE MY FINGER OR YOUR MARBLE, CAUSES IT TO.



IF THE MARBLE OR YOUR FINGER DOESN'T "FORCE" MOVEMENT, IT WILL NEVER MOVE!



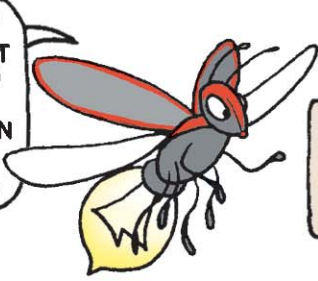
THAT'S CORRECT, SCORPY! THE SECOND PART OF THIS LAW SAYS, "AN OBJECT IN MOTION WILL STAY IN MOTION UNLESS A FORCE ACTS ON IT." WHEN I SLIDE THIS HOCKEY PUCK ALONG THE TABLE, IT WILL NOT GO FOREVER. THIS IS BECAUSE A FORCE, CALLED FRICTION, IS ACTING ON THE HOCKEY PUCK. FRICTION TURNS FORWARD MOTION INTO HEAT, WHICH CAUSES THE OBJECT TO SLOW DOWN AND EVENTUALLY STOP.



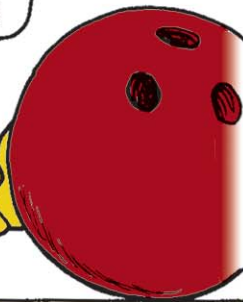
SO, IT'S THE FRICTION BETWEEN THE TABLE AND THE PUCK THAT CAUSES IT TO STOP.



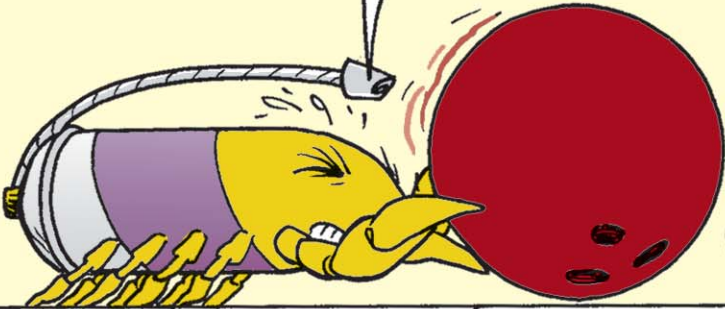
NEWTON'S SECOND LAW TALKS ABOUT ACCELERATION, OR INCREASE IN SPEED. IT SAYS THAT THINGS MOVE FARTHER AND FASTER THE HARDER THEY ARE PUSHED. THEY WILL ALWAYS MOVE IN THE DIRECTION THEY ARE PUSHED OR PULLED UNLESS SOMETHING CHANGES THAT DIRECTION.



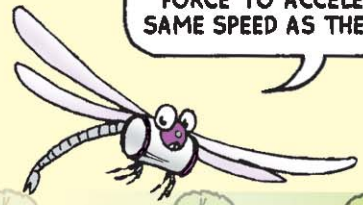
SO THE HARDER I PUSH ON THIS OBJECT, THE FARTHER AND FASTER IT WILL GO!



WOW, DRAGONFLY, I HAVE TO PUSH MUCH HARDER ON THIS BOWLING BALL, JUST TO MAKE IT GO AS FAR AS THIS TENNIS BALL!

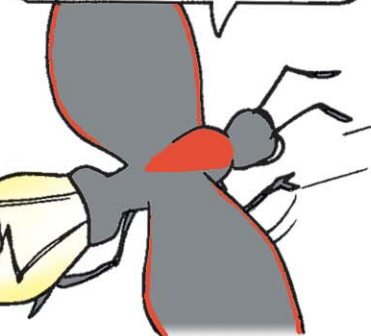
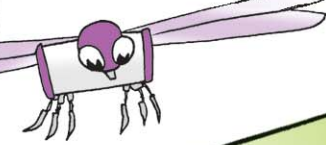


THAT'S RIGHT, SCORPY! EVEN THOUGH THE BALLS ARE TRAVELING THE SAME DISTANCE, A HEAVIER OBJECT NEEDS MORE FORCE TO ACCELERATE AT THE SAME SPEED AS THE LIGHTER ONE.



NEWTON'S THIRD LAW SAYS, "FOR EVERY ACTION THERE IS AN EQUAL AND OPPOSITE REACTION." FOR EXAMPLE, IF YOU ROLL THIS TENNIS BALL INTO ANOTHER, THE OTHER ONE WILL START TO MOVE.

IT REACTED TO BEING BUMPED INTO BY THE FIRST TENNIS BALL!



I HOPE NEWTON'S LAWS ARE MAKING THE REASON FOR MOTION CLEARER TO YOU NOW, SCORPY.

YOU CAN SAY THAT! NEWTON'S LAWS CERTAINLY GET A REACTION.



