

GRAVITY!



THE SKS DREW WHAT THEY IMAGINED THEY WOULD SEE IF THEY LOOKED BACK AT THE EARTH FROM SPACE

The SKs have been talking a lot about gravity, and it all started with Henry's question: When you turn a cup upside down the water falls down. If there is water on the bottom of the Earth, why doesn't it fall down?

The SK children had some very interesting answers.

"Because it is getting holded by gravity"

"When you jump, gravity pulls you down."

"What is gravity?" asked the teacher.

"Something that holds you down to the ground, otherwise we would be up on the ceiling or something. So the gravity keeps the Earth down, too."

"If gravity wasn't invented you would go up to the sky and up into space."

"God invented gravity."

"Gravity can hold some things up - like airplanes, helicopters and balloons."



NICOLA'S SUN IS MADE OF HOT, SWIRLING GASES



COLIN'S SUN IS SHOOTING SOLAR FLARES



AMIRA'S SUN HAS FIRE STICKS

To better understand how gravity works on Earth, the SKs tried an experiment to see how weight and size effect **impact**.

Question: *What will happen when we drop one large foam ball and one very small metal ball from the stairs straight down into the sandbox?*

Predictions: "The big ball will make a little dent because it is not very heavy."

"These will make like a crater in the sand."

"Like a hole, right?"

"Small ball, small hole. Big ball, big hole."

"The metal ball won't stay on the sand. It will go in the sand because it is light."

The heavier large ball will stay on top."

What happened:

"It (the metal ball) shot so fast into the sand."

"It disappeared!"

"It went under the sand. It didn't disappear."

"Well, heavier things when you drop them on light things (like sand) they sink, but light things when you drop them don't."



I NOTICED THE METAL BALL MADE A DEEPER MARK



I NOTICED THE SMALL BALL SANK BECAUSE IT WAS MADE OF METAL



I NOTICED THE LITTLE BALL MADE A DEEP HOLE AND THE BIG BALL MADE A WIDE HOLE



I NOTICED THE SMALL SILVER BALL WENT DOWN IN THE SAND AND THE BIG FOAM BALL MADE A CIRCLE IMPRINT

The SKs also looked at how size and weight effect the speed with which something falls. We started with a small plastic fox and a big plastic hippo, dropping them from the same height at the same time. Here are pictures of all the things we compared.



PREDICTIONS!

1. THE FOX IS GOING TO HIT THE TABLE FASTER BECAUSE IT IS SMALLER AND LIGHTER.
2. BECAUSE IT IS LIGHTER, THE FOX IS GOING TO FALL THROUGH THE AIR FASTER.
3. THE HIPPO IS BIGGER AND TAKES UP MORE SPACE, SO IT WILL GO SLOWER.
4. THE HIPPO IS GOING TO GO FASTER BECAUSE IT IS HEAVIER.
5. THE HIPPO WILL BREAK THROUGH THE AIR FASTER.

WHAT HAPPENED?

“They both hit at the same time!”

“There weren’t two bangs - bang, bang - just one - BANG!”

“They both went the same fastness.”

AND WITH THE CHICKEN?

“Same!”

“It doesn’t matter how small, they both hit just the same!”

“But not if one was a feather.”

SO WE TRIED IT WITH A FEATHER...

“The hippo is going to hit first for sure!”

“The feather is just going to float.”

“It’s going to fall like this.” (Several children waft their hands slowly back and forth and they go down.)

AND?

“The hippo first!”

“The feather went down way slower.”

“But it didn’t go back and forth. It just went down slow.”

“Maybe cause the air isn’t moving as much as outside.”

Our last gravity experiment helped us consider what might effect how fast different balls rolled down ramps.

One of the things that complicated our observations during this experiment had to do with assumptions about how heavy the balls were. Many children were very sure that the small metal ball was the heaviest, because it was made of the heaviest material.

When we got out the scales, we discovered that the big red styrofoam ball was the heaviest, even though it feels so light in one's hand. That led to a discussion about **density**.

WE USED FOUR BALLS THAT WERE DIFFERENT IN SIZE, WEIGHT, AND WHAT THEY WERE MADE OF.

also made us rethink how we understood an earlier experiment when we dropped objects into sand. The SKs started to wonder if **density**, not **weight**, was the most important thing that effected impact.

In the end, the middle sized silver ball was almost always the fastest going down the ramps. The SKs decided this was because the silver ball is second heaviest of the five balls we tested, and almost as smooth as the metal ball. But if one ramp was made more steep, even the very light, slightly "scratchy" blue foam ball went faster!

WE FOUND THREE THINGS THAT SEEMED TO EFFECT HOW FAST THE BALLS ROLLED DOWN THE RAMPS.



WEIGHT SEEMED TO HAVE SOME EFFECT - THE HEAVIER THE BALL, THE FASTER IT *USUALLY* ROLLED



TEXTURE ("GRIP") ALSO SEEMED TO EFFECT THINGS. SMOOTHER BALLS WENT FASTER (AND FARTHER!) EVEN IF THEY WERE A LITTLE LIGHTER.



THE SLOPE OF THE RAMP WAS VERY IMPORTANT. THE STEEPER THE SLOPE, THE FASTER ALL THE BALLS ROLLED!

