GET A GRIP!

One of the most incredible and astonishing things Thunder players can do is grip and palm a basketball effortlessly, slinging it around to their teammates or dunking the game winning goal. You can discover how grip strength and the design of a basketball come together to create expert gameplay with this series of experiments!

Pro-tip: This activity can be done in a home or a classroom. It can be done by an individual student, in a small student group, or by a family.

HERE'S WHAT YOU WILL NEED:

- **A ruler**
- **A variety of round things with different textures and densities** *(examples: different sports balls, fruits, fidget/stress reliever balls, round pillows/stuffed animals, etc.)*
- **Balloons**
- **A fabric tape measure** *(or string)*
- **An assortment of different coverings** *(examples: pieces of different fabrics, plastic wrap, t-shirt, notebook paper, wax paper, foil, plastic bag, newspaper, etc.)*
- **Rubber bands**
- **Tape**
- **A journal or notebook**
- **Pencil or pen**
- **An internet-enabled device** *(optional)*
- **Scale** *(optional)*

WARMUPS

Thunder players have—among other athletic prowess—incredible hands! Hamidou Diallo, for instance, is 6'5" and has a hand span of 8.5". Meanwhile, Steven Adams is 6'11" and his hands are 11"—and his aren't even the biggest hands in the league! There is often a correlation between height and hand size, but not always. Michael Jordan, for instance, has hands that are 11.4"—average for a man who is 7'9"—but Jordan himself is 6'6". It takes a variety of different hand sizes and shapes to make an entire team of good players, though!

To begin, measure your own hands! Grab a ruler, stretch each hand as far as you can, and measure how many inches it is from the tip of your thumb to the tip of your pinkie. Measure both of your hands and record this data in your journal.

Are both of your hands the same size? What do you notice about the shape of your hands? Do you have wide palms or are they more narrow? How about your fingers? Are they long or short compared to the size of your palm?

Compare your observations about your own hands to the observations of your fellow students, or, grab a family member or two and ask to measure and observe the shape of their hands!

Next, it's time to test and see how your hands might fare when it comes to gripping things, and what relationships you might be able to draw about Thunder players' hands. Grab an assortment of different round objects. If you have access to a basketball—great! Definitely grab it for these challenges. You can also use any other sports balls, like a baseball, softball, or tennis ball. In addition, try to find some different fruits to test. You might consider an apple, orange, grapefruit, or even a small melon like honeydew or cantaloupe!

Pro tip: If you're being a Devon Thunder Explorer at home this season, be sure to ask for permission before scavenging any fruit for your experiments. You don't want to accidentally squeeze and smoosh all the fruit that was going to be eaten for breakfast tomorrow!

In addition to various sports balls and fruits, collect any other round objects you have in your classroom or at your house. Try to find as much variety as you can in both the size of the round items and the firmness/squishiness of them.

Make a table in your journal so that you can record your findings throughout this experiment. You're going to be documenting four specific things about each round object you test: how firm or squishy it is on the inside, what its outside texture is, how much it weighs, and how easy it is for you to grip from the top down with one hand. (If you have a scale, you can definitely weigh each object. But don't worry if you don't—just use rough measurements of weight, like "heavy," "medium," or "light"—or whatever designations with which you want to come up!)

Conduct these tests on all of the round objects you have and write down your findings and observations.

Which object was the easiest for you to grip with just one hand? Which were difficult or maybe even impossible to grip?

Which was more important in regards to ease of grip—the material or core inside of the round object or the texture on the outside? Or were the two equally important?

GAME TIME

It's time to take your exploration of the design of a basketball even further. Start by taking a few different balloons and blowing them up to different levels of inflation. (So for instance, only blow one up a little bit, blow one up an average amount, and then blow one up as full as you think you can without popping it.) Experiment gripping and palming these different balloons just like you did in Warm Up. Find the size of inflation that is easiest for you to grip while still large enough that it provides a bit of a challenge—just like a regulation basketball for a Thunder player! This will be your ball's test core for the next activity. Measure the circumference of your balloon using either your fabric tape measure or a piece of string that you measure on your ruler. Record this in your journal.

Pro tip: If your balloon accidentally pops at any point during these next experiments, just blow up a new one to the same circumference so that you keep your tests consistent!

Next, grab your assortment of coverings that you gathered. These could be pieces of fabric, plastic bags, bubble wrap, wax paper, foam sheets, felt—literally anything that you can wrap around your balloon (which is going to act as the core of your basketball). Make a new chart in your notebook where you can list all of the different ball covers you try, as well as the pros and cons of each one. Your goal in this challenge is to discover which covering you have makes it easiest for you to securely grip your "basketball."

To test each covering, secure it on the bottom of the balloon with tape, a rubber band, or whatever else you have on hand (except staples, obviously!). Grip the balloon just like you did with your round objects in Warm Up—with one hand from the top down. Make notes in your chart for each covering about whether you can successfully grip and palm the balloon.

ANALYZE THE REPLAY

What happened?

While basketball has been around for over 100 years, the ball itself has undergone quite a bit of evolution in that time! It is clearly specifically engineered to be what it is right now. Based on your test results from both the Warm-up and Game Time activities' findings, why do you think the current design is the one we commonly use? What are the benefits of a regulation sized diameter? What about the bumpy, pebbled areas of the ball? What about the recessed lines that form the famous basketball design? What about the air pressure at which it's kept? If you've ever played with a squishy or flat basketball, you already know how important air pressure is!

If you don't have access to a basketball in person, look up the specifics on regulation basketballs as well as the differences between men's, women's, and youth basketballs. You can also look up the history of the basketball and how its design has changed throughout the past century.

Look up pictures of a variety of NBA players' hands. Do you notice any similarities or differences between their hands? What size of palms do they have—wide or narrow? How about their fingers? What position might excel more with large, blocky hands, and who on the team might benefit more from long, nimble fingers? Additionally, now that you've tested your own hand and grip strength, what are some connections you can make about the enormous strength and precision of Thunder players' hands?

OVERTIME
Let's take it further

Want to take it even further? Research different fingertip grip and hand strengthening exercises. Thunder players do have some amazing genetics that might give them a tendency to having strong and agile hands, but none of them actually have superpowers like Spider-Man's extra-grippy fingertips! They have to do a wide variety of exercises for their hands just as they do for their entire bodies.

COACH'S CORNER
Additional information and explanations for parents and educators

In this Devon Thunder Explorers activity, students explored both the importance of hand and fingertip strength, as well as how it ties to why the modern regulation basketball is engineered the way that it is. Hand strength and dexterity is incredibly important to basketball players, but it's a strength needed in a lot of different sports, including rock climbing, hockey, baseball, and weight lifting, to name just a few. Just as their height is crucial to the success of NBA players, students also explored how hand shape, size, and strength impacts which players play the best roles on a team.

In addition to testing their own hand strength, students also performed a series of experiments to test different ball coverings and why some would be preferable to others. Current regulation basketballs are made from an inner rubber bladder, layers of fiber, and covered in a leather or rubber covering. Indoor basketballs are covered in leather, and often must be "broken in" when they're new. Outdoor or all-surface basketballs are usually covered in rubber as it's far more durable being bounced against concrete. The ball is inflated to a specific pressure, and must rebound to 49-54" when dropped on a wood court from a starting height of 6'.

OKLAHOMA ACADEMIC STANDARDS

SCIENCE STANDARDS	4th Grade	5th Grade	6th Grade
4.PS3-4: Energy	●		
5-PS1-3: Matter and its interactions		●	
MATH STANDARDS			
4.D.1.2: Collect, organize, and analyze data	●		
PHYSICAL EDUCATION STANDARDS			
S3.M2: Engages in physical activity			●
S3.M6: Fitness knowledge			●
S3.M14: Fitness knowledge			●