



Basketball

Grade Five

Welcome to this Grade 5 Basketball Unit Plan presented by a research team at George Mason University! Our goal with this plan is to present lesson activities for physical education instruction while integrating STEM content. Using Virginia Standards of Learning, we sought to combine relevant science topics for fifth graders with games to develop basketball skills. This plan is flexible, so feel free to use this unit plan in its entirety, or use lesson activities and games as you see fit.

We have found that integrating STEM topics is extremely beneficial for students. Students can get extra time exploring their classroom content. This integration can also pique interest in activities for those who may not usually be as engaged during PE. Some of our lesson plans already include science concepts, but we encourage you to reach out to science teachers at your school to not only get some new ideas, but to customize your curriculum to your students!

Good luck in your unit and lesson planning! We hope the activities presented are useful to you. If you have any questions, or want to participate in research involving this unit please feel free to reach out to Risto Marttinen at George Mason University (rmarttin@gmu.edu)

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Block Plan

| Basketball Grade 5 Block Plan | | | |
|-------------------------------|---|--|---|
| Day | Objectives | PE Skills & STEM Content | Assessments |
| 1 | <p>Students will be able to (SWBAT) demonstrate hand dribbling and shooting cues by obtaining a score of at least 3 out of 5 for each skill on a teacher observational assessment by the end of the unit.</p> <p>SWBAT to make a hypothesis about force as it relates to shooting and dribbling, and use data to draw conclusions about each in a scientific method worksheet.</p> <p>SWBAT cooperate in various formations (pairs vs. larger groupings) during activities.</p> | <p>Introduction to Dribbling and Shooting + The Scientific Method</p> <p>PE Skills: Dribbling, Shooting</p> <p>STEM Content: Scientific Method</p> | <p>Scientific Method</p> <p>Teacher Observation Checklist</p> |
| 2 | <p>Students will be able to (SWBAT) demonstrate hand dribbling and shooting cues by obtaining a score of at least 3 out of 5 for each skill on a teacher observational assessment by the end of the unit.</p> <p>SWBAT demonstrate the constant movement of tectonic plates through game play (dribbling).</p> <p>SWBAT demonstrate respectful behavior in physical activity setting.</p> | <p>Dribbling Intro</p> <p>PE Skills: Dribbling</p> <p>STEM Content: Tectonic Plates/Earthquakes</p> | <p>Teacher Observation Checklist</p> |
| 3 | <p>SWBAT to shoot from the Free Throw Line 70% of the time in a partnered activity.</p> <p>Students will be able to (SWBAT) demonstrate hand dribbling and shooting cues by obtaining a score of at least 3 out of 5 for each skill on a teacher observational assessment by the end of the unit.</p> | <p>Shooting + Determining Precision and Accuracy</p> <p>PE Skills: Shooting/Accuracy</p> <p>STEM Content: Accuracy and Precision</p> | <p>Exit Ticket for Shooting + Precision/Accuracy</p> <p>Teacher Observation Checklist</p> |

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| | <p>SWBAT distinguish the difference between precision and accuracy when shooting in an activity worksheet.</p> <p>SWBAT cooperate in various formations (pairs vs. larger groupings) during activities.</p> | | |
| 4 | <p>Students will be able to (SWBAT) demonstrate hand dribbling and shooting cues by obtaining a score of at least 3 out of 5 for each skill on a teacher observational assessment by the end of the unit.</p> <p>SWBAT cooperate in various formations (pairs vs. larger groupings) during activities.</p> | <p>“Basketball Scramble!”²</p> <p>PE Skills: Shooting, dribbling</p> <p>STEM Content: Scientific Method, Cell structures, Phases of Matter</p> | <p>Notecards for Activity</p> <p>Teacher Observation Checklist</p> <p>Student Worksheet</p> |
| 5 | <p>Students will be able to (SWBAT) demonstrate hand dribbling and shooting cues by obtaining a score of at least 3 out of 5 for each skill on a teacher observational assessment by the end of the unit.</p> <p>SWBAT to identify the basic role of a lysosome after acting out its function in a dribbling/guarding activity.</p> <p>SWBAT practice safe and respectful stealing and guarding.</p> | <p>“Basketball Pinball”¹: Dribbling + Lysosomes</p> <p>PE Skills: Dribbling, guarding, stealing</p> <p>STEM Content: Cell structures (lysosomes)</p> | <p>Exit Ticket “Basketball Pinball” + Lysosome Activity</p> <p>Teacher Observation Checklist</p> |
| 6 | <p>SWBAT demonstrate the proper cues for a lay up 70% of the time in a peer assessment.</p> <p>SWBAT demonstrate land deposition through game play (lay ups).</p> <p>SWBAT demonstrate respectful behavior in physical activity setting.</p> | <p>Lay Up - First to 20</p> <p>PE Skills: shooting, lay ups</p> <p>STEM Content: Deposition</p> | <p>Lay Up Partner Checklist</p> |

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| <p>7</p> | <p>SWBAT demonstrate hand dribbling and shooting cues by obtaining a score of at least 3 out of 5 for each skill on a teacher observational assessment by the end of the unit.</p> <p>SWBAT distinguish the order of layers of the Earth's interior through game play.</p> <p>SWBAT cooperate in various formations (pairs vs. larger groupings) during activities.</p> <p>SWBAT practice safe and respectful stealing and guarding.</p> | <p>"Team Dribble Shoot and Score"²</p> <p>PE Skills: Shooting, dribbling, stealing, guarding</p> <p>STEM Content: The Earth's Interior</p> | <p>Teacher Observation Checklist</p> |
| <p>8</p> | <p>SWBAT distinguish the difference between heterogeneous and homogeneous mixtures in a warm-up activity.</p> <p>Students will be able to (SWBAT) demonstrate hand dribbling and shooting cues by obtaining a score of at least 3 out of 5 for each skill on a teacher observational assessment by the end of the unit.</p> <p>SWBAT identify the phases of matter (solid, liquid, and gas) and demonstrate their characteristics based on temperature in a warm-up activity.</p> <p>SWBAT cooperate in various formations (pairs vs. larger groupings) during activities.</p> <p>SWBAT practice safe and respectful stealing and guarding.</p> | <p>Mixtures Warmup</p> <p>Basketball Game</p> <p>PE Skills: Shooting, dribbling, stealing, guarding, lay ups</p> <p>STEM Content: Mixtures</p> | <p>Teacher Observation Checklist</p> |

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Virginia Standards of Learning

Physical Education SOL's

Motor Skill Development PE- 5.1: The student will demonstrate mature movement forms, create movement patterns, and begin to describe movement principles.

- 5.1a: Demonstrate mature form in locomotor, non-locomotor, and manipulative skill combinations in more complex and dynamic environments and modified sports activities, to include overhand and underhand throw and catch, execution to a target, hand dribble, foot dribble, consecutive striking with a partner over a net or against a wall, and striking a ball while stationary and moving.
- 5.1d: Demonstrate use of space in a variety of activities.
- 5.1e: Demonstrate accuracy in a variety of activities
- 5.1f: Demonstrate use of force in a variety of activities

Social Development- 5.4: The student will participate in establishing and maintaining a safe environment for physical activities.

- 5.4d: Explain the importance of inclusion in physical activity settings.
- 5.4e: Describe and demonstrate respectful behavior in physical activity settings.

STEM SOL's

Scientific Investigation, Reasoning, and Logic- 5.1: The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which-

- 5.1d: hypotheses are formed from testable questions
- 5.1i: inferences are made and conclusions are drawn
- 5.1k: current applications are used to reinforce science concepts.

Matter- 5.4: The student will investigate and understand that matter is anything that has mass and takes up space; and occurs as a solid, liquid, or gas. Key concepts include-

- 5.4a: distinguishing properties of each phase of matter
- 5.4b: the effect of temperature on the phases of matter
- 5.4e: mixtures including solutions

Living Systems- 5.5: The student will investigate and understand that organisms are made of one or more cells and have distinguishing characteristics that play a vital role in the organism's ability to survive and thrive in its environment. Key concepts include

- 5.5a: basic cell structures and functions

Earth Patterns, Cycles, and Change-5.7: The student will investigate and understand how Earth's surface is constantly changing. Key concepts include

- 5.7d: the basic structure of Earth's interior
- 5.7e: changes in Earth's crust due to plate tectonics
- 5.7f: weathering, erosion, and deposition

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Objectives

Physical Education Objectives

Psychomotor Skills

- Students will be able to (SWBAT) demonstrate hand dribbling and shooting cues by obtaining a score of at least 3 out of 5 for each skill on a teacher observational assessment by the end of the unit.
- SWBAT to shoot from the Free Throw Line 70% of the time in a partnered activity.
- SWBAT demonstrate the proper cues for a lay up 70% of the time in a peer assessment.

Cognitive Skills

- SWBAT distinguish the difference between precision and accuracy when shooting in an activity worksheet.

Affective

- SWBAT demonstrate respectful behavior in physical activity setting.
- SWBAT cooperate in various formations (pairs vs. larger groupings) during activities.
- SWBAT practice safe and respectful stealing and guarding.

STEM Objectives

- SWBAT identify the phases of matter (solid, liquid, and gas) and demonstrate their characteristics based on temperature in a warm-up activity.
- SWBAT distinguish the difference between heterogeneous and homogeneous mixtures in a warm-up activity.
- SWBAT to make a hypothesis about force as it relates to shooting and dribbling, and use data to draw conclusions about each in a scientific method worksheet.
- SWBAT to identify the basic role of a lysosome after acting out its function in a dribbling/guarding activity.
- SWBAT distinguish the order of layers of the Earth's interior through game play.
- SWBAT demonstrate the constant movement of tectonic plates through game play (dribbling).
- SWBAT demonstrate land deposition through game play (lay ups).

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Organization

Time

30-45 minute lessons. Unit length: eight lessons

Space Needed

For this basketball unit, a 74' x 50' court or larger should be utilized.

Equipment and Supplies

- Basketballs: at least one for every student
- One jersey per student
 - In various colors but enough of each color for students to group together based on it
- One worksheet/exit ticket per student (if applicable for the lesson of the day)
- Hula hoops: at least one per student
- Poly-spots: at least one per student

Basic Grouping of Students

Group sizes will vary based on the lesson. Groups of 2-3 students will be utilized for partnered activities.

Content

Introduction to Basketball

The Origins of Basketball



Basketball first came to be in 1891. James Naismith, a graduate student and physical education teacher, drew inspiration from games like American and English rugby, lacrosse, soccer, and “duck on a rock” to come up with the new game.⁸ The initial game featured two peach baskets as goals and was dictated by 13 rules Naismith created.⁸ Basketball eventually became more widespread and was officially recognized as a permanent winter sport in 1905.⁸

(Want to find out more about basketball’s creation and James Naismith? Click [here](#).)

The Rules and Regulations of Basketball

USA Basketball⁹ provides recommendations for youth basketball. As these guidelines specifically apply to basketball competitions, rules included below are in support of this unit’s instruction of basketball skills. The rules provided for the group “Ages 9-11” best applies to fifth grade students.

Equipment and Court Specifications ⁹

| Topic | Recommendation |
|-----------------------------|-------------------------------|
| Size of Ball | Boys and Girls size 6 (28.5”) |
| Height of Basket | 9’ |
| Size of Court | 74’x50’ |
| Distance of 3-Point Arc | Not Applicable |
| Distance of Free Throw Line | 14’ |

Rationale ⁹:

Size of Ball A smaller basketball for the younger age segments is advised due to the size of a child’s hand as well as their developing skill level. A smaller ball allows for better control and success. *Size of Court:* For 9-11 year-olds, a 74’x 50’ court is more appropriate for younger children based on their relative size in space.

Distance of 3-Point Arc For 9-11 year-olds, although the 3-point arc may exist on the floor, all baskets made beyond this arc only count as two points. Therefore, the distance of the line is not applicable

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for these ages. Eliminating the 3-point basket will encourage players to shoot from within a developmentally-appropriate range.

Distance of Free Throw Line 9-11 year-olds should take free throws 14 feet from the basket to develop proper form and increase success.

Height of Basket Utilizing a lower basket height for 9-11 year-olds allows children to develop proper shooting form and increases the opportunity for shooting success.

Game Structure ⁹

| Topic | Recommendation |
|--------------------------|--|
| Game Length | Four 8-minute periods |
| Time Between Periods | 1 minute |
| Extra Period(s) | 2 minutes |
| Scoring | Free throw: 1 point, all field goals: 2 points, no 3-point field goals |
| Timeouts | Two 60-second timeouts permitted for each half of play. One 60-second timeout granted for each extra period. Unused timeouts may not carry over to the next half or into extra periods |
| Start of Game Possession | Coin flip. Team awarded possession starts with throw-in at half court |

Rationale ⁹:

Scoring: All field goals for 9-11 year-olds are worth two points to encourage children to shoot within a developmentally-appropriate range. This allows for proper mechanics and form. While these age segments may attempt a shot behind the 3-point arc, any field goal made behind the arc will only count as two points.

Timeouts: Managing the way timeouts are called allows for better game flow and decision making by the player(s).

Start of Game Possession For 9-11 year-olds, a coin flip will determine the team that will start with the ball to mitigate significant differences in height and coordination among children. Alternating possession rules will then ensue throughout the game.

Game Tactics ⁹

| Topic | Recommendation |
|--------------|--|
| Playing Time | Equal playing time should be attempted for all students. Focus on small sided games so there is maximum participation. |
| Set Defense | Only player-to-player defense throughout the |

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| | |
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| | competition. |
| Pressing Defense | Player-to-player defense may be extended full court in the 4th period and each extra period Leading team may not extend the defense over half court when leading by 25 points or more |
| Double-Team/Crowding | Double-team/crowding is not allowed throughout the competition |
| Stealing From the Dribbler | Teachers' discretion throughout the competition |

Rationale⁹:

Playing Time: To ensure that all young children participating in the sport have an opportunity to experience the game, equal and fair playing time is important for all students. Focus on small sided games so there is maximum participation.

Set Defense: The player-to-player requirement for 9-11 year-olds encourages physical activity and movement, and promotes the development of individual skill related to guarding a player both on and off the ball.

Pressing Defense: For 9-11 year-olds, permitting player-to-player defense to extend full-court in the 4th and extra periods only allows players to become accustomed to full-court defense while not having to understand sophisticated zone presses. It also allows for an introduction to competitive tactics.

Double-Team/Crowding: Crowding the ball with multiple players (referred to as “double-teaming”) is not allowed for 9-11 year-olds due to skill and size discrepancies among children at these ages.

Highlighted Game Play Rules⁹

| Topic | Recommendation |
|--|---|
| Backcourt Timeline | 10 seconds |
| Shot Clock | Not applicable |
| 5 Seconds Closely Guarded | Only when the offensive player is holding the basketball |
| Clock Stoppage | On any dead ball |
| Length of Time for a Free-Throw | 10 seconds |
| Number of Players Permitted on Free-Throw Lane | Offense may have 3 players on the lane, including the shooter Defense may have 3 players on the lane |

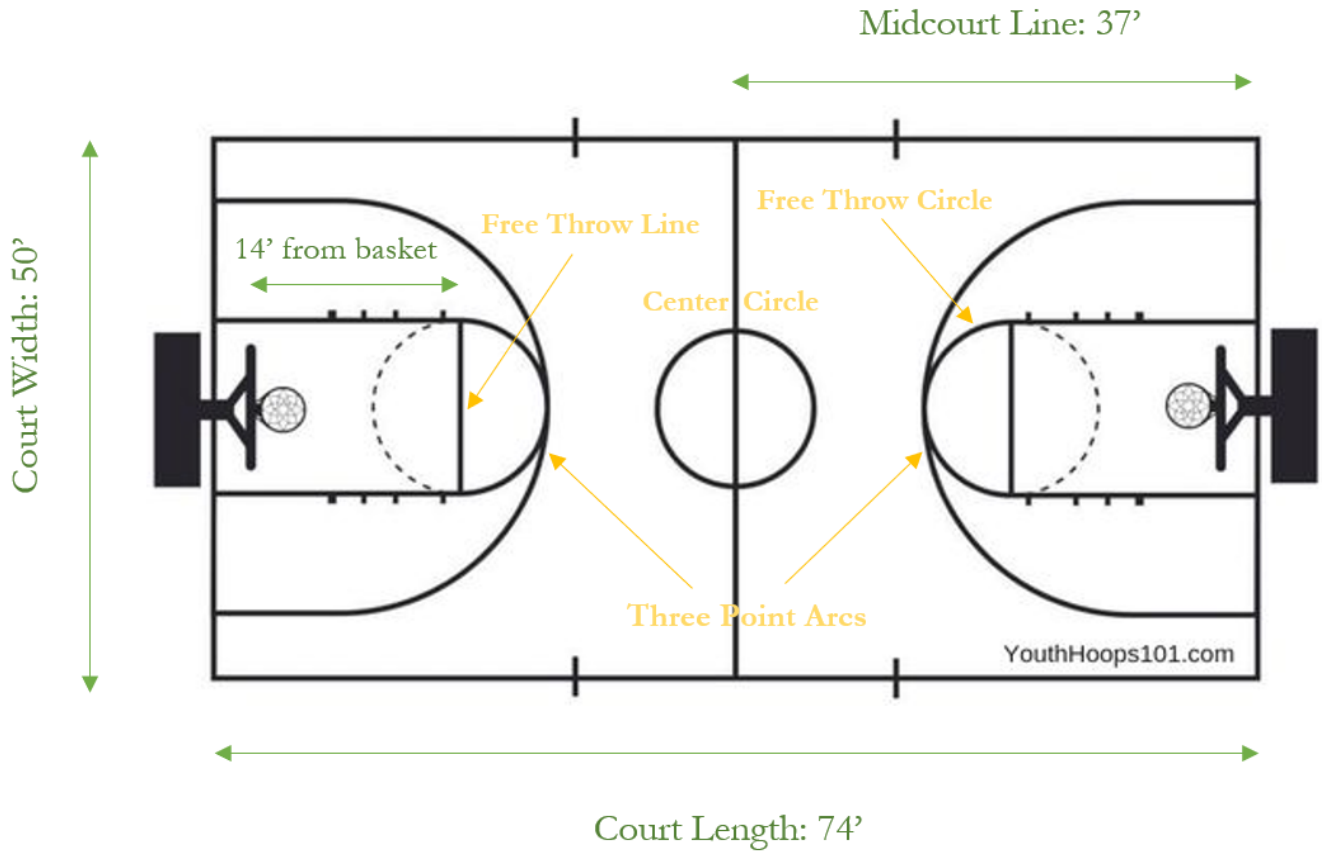
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| Substitutions | Either team may substitute when the clock is stopped |
| Advancement of Ball after a Timeout | Not applicable |

Using USA Basketball’s guidelines⁹ for 9-11 year old basketball competition, a court diagram has been constructed from a template.⁴



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Skills

Videos for each skill have been included.

Passing -

Chest pass: A chest pass is a pass from chest to chest. The person with the ball will step into their pass, while holding the ball at their chest, elbows out, push through to your teammates chest and follow through, so your fingers should be pointing at the target.

Bounce pass: A bounce pass is from player, to ground, to player. So, the person with the ball will step into their pass, push the ball into the ground, follow through so that your fingers are pointing at the target and the bounce should be about $\frac{3}{4}$ of the way to the intended target. The receiver of the bounce pass should be getting the ball about waist-height.

Overhead pass: An overhead pass begins with the ball overhead, so elbows are pointing to the sky. Release the ball at eye level and always follow through with your fingers pointing at the target.

Dribbling - eyes up, dribbling on the finger pads, keeping the ball in motion. Example, for the figure 8 drill, one will keep the ball in motion in the figure 8 movement, around and through the legs.

Shooting - Shooting starts with feet shoulder-width apart. The shooting arm will take on an "L-shelf." When ready to shoot, the elbow will be in line with the target, followed by the shooting arm going up and out. Bend your knees and when you shoot, follow your hand through like a hand in the cookie jar.

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Lead Up Games

The purpose of this section is to present games for pre-lesson warm-ups and activities to split students up into various formations.

Warm Up: Phases of Matter + Dribbling

Before starting, background about the phases of matter can be found in the [Glossary of Terms](#) and [Resources](#) sections.

Equipment Needed/Formation

- Each student will need a basketball.
- Students will be acting as molecules in each phase of matter.

Rules

- In a solid, its molecules are packed tightly together into a fixed shape.
 - Start with students close together and ask if they know what a solid is.
 - Establish this close formation as a solid state.
- When temperature rises, a solid will eventually melt into a liquid.
 - Ask students if they know what happens to a solid when it gets warm.
 - Use ice as an example - answer: melts -> liquid.
- With the increase in temperature, the molecules of a liquid are starting to move and spread out more. A liquid will take the form of its container.
 - As students “melt” into their liquid formation, have students spread out slightly and dribble in place.
 - Restrict students’ spacing out to lines on the court (ex. up to the midcourt line) and explain how liquids take on the shape of their containers.
- As temperature is increased more, a liquid will eventually evaporate into a gas.
 - Ask students if they know what happens when a liquid gets warm.
 - Use water as an example - answer: evaporates -> gas.
- In the gaseous state, the molecules are spread out very far apart and moving quickly.
 - Have students move around and space out.
 - Students will dribble as they walk or jog to pick up heart rate.

Extensions/Modifications

- This activity can be done without basketballs as well.
 - Solid: students close together
 - Liquid: students move apart and jog in place
 - Gas: students move even farther apart and jog around the court
- Play with the different temperatures (ex. shout out “It’s getting really cold!”) and see how students move in and out between formations.
- This activity can also be used to get students to change formations throughout the lessons (ex. if they’re spread out doing activities at the end of a lesson, have them come together by saying you want a solid formation).

Warm Up: Dribbling or passing + If-Then³

- In this short warm-up, students answer science questions by performing a certain dribbling or passing skill.
 - A [list of science questions](#) has been provided to choose from.

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Formation Activity: Mixtures

In support of this activity about heterogeneous and homogeneous mixtures, in depth definitions and explanations can be found in the [Glossary of Terms](#) and [Resources](#) sections.

Equipment Needed/Formation

- When students split up into large groups, introduce the concepts of mixtures.
 - When breaking up into two groups, have one be identified by regular/PE clothing and the other by jerseys.
 - When breaking up into more than two groups, have groups be defined by the colors of their jerseys/shirts.

Rules

- After passing out jerseys, keep the students mixed up before splitting up for the day's activity. Ask if they know what the word heterogeneous/the stem "hetero" means (answer: different/opposite).
- After getting their answers, introduce the concept of mixtures: when in one large, mixed group of regular clothing and jerseys/different jersey colors, they all look different. They make up a heterogeneous mixture.
 - Use the example of a cookie: a chocolate chip (or M&M) cookie has different ingredients and you can see the difference between the cookie part and the chocolate part.
- When they split off into their groups, this will be their homogeneous mixture - they are with others that are the "same."
 - Again, use the example of a cookie: when a sugar cookie's different ingredients come together, the whole cookie looks the same. This is a homogeneous mixture.
- Similar to the temperature + phases activity, use this to have students switch formations.
 - Homogeneous mixtures: split off into their assigned groups
 - Heterogeneous mixtures: come and mix up together

Warm-Up: Red light, Green light

Equipment Needed/Formation

- Students will line up on the court.
- The entire length/width of the court can be used for this game.

Rules

- The teacher will call out either red or green light. Each color has a speed.
 - Red light means stop
 - Yellow light means slow down
 - Green light means go!

Extensions/Modifications

- Incorporate basketballs into this activity.
 - Red light: stop with the ball to your chest
 - Yellow light: walk and dribble
 - Green light: run and dribble!

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Activities to Develop Skills

Lesson Activity: Introduction to Dribbling and Shooting + The Scientific Method

This lesson is intended to be the first activity of the basketball unit. Students will be reintroduced to dribbling and shooting, while playing with different amounts of force for each skill.

Equipment Needed/Formation

- Students will be in groups of 3-5.
- There will be two stations: dribbling and shooting. At the halfway point in the period, students should switch stations.
- Depending on space at your school, the shooting station will be on the court so that the hoops can be used. The dribbling station will be on the outer edges of the courts.
- At the end of each station, give students a few minutes to write their conclusions. After completing both stations, students will turn in the worksheet.

Rules

- Station 1: Dribbling
 - Students are tasked with dribbling while sitting, and dribbling while standing.
 - While sitting, students should sit with their legs apart and bent upwards. Their goal is to dribble the ball between their legs while keeping the ball in control and without the ball going too high (past their knees).
 - While standing, students will dribble the ball at about hip height, keeping it in control. Dribbling to their front or side is fine.
 - Each group will have one ball. Students will take turns dribbling while sitting and standing.
 - Use this station as an initial observation of their dribbling skills and form.
- Station 2: Shooting
 - Students will be shooting from the front of the Free Throw Circle and from the Free Throw Line. Place different colored cones to mark where they should shoot
 - At the start of this station, each group will be given a ball. They will stand in line with other groups to shoot, but they should share one ball with their group members.
 - Students will line up to shoot once from each cone. Then, they will go to the back of the line of students. If there is time, they can shoot again.
 - Use this station as an initial observation of their shooting skills and form.
- At the beginning of each station, give students a few minutes to read over their [scientific method worksheets](#). Before they begin dribbling/shooting, they should make their hypotheses.
- The scientific method worksheet relates force to dribbling and shooting.
 - Dribbling: it takes more force to make the ball go higher.
 - Shooting: it takes more force to shoot the ball from a farther distance.
 - See the [Resources](#) section for more information about the connection of physics and basketball.
- During the station, students should write the results of their “experiment” while other group members are using the ball.

Cues

- Dribbling
 - Fingerpads
 - Waist level

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- Eyes up
- Shooting
 - Feet shoulder-width apart
 - L-shelf (the shooting arm)
 - Elbow in line with target
 - Up and out
 - Bend your knees
 - Hand in the cookie jar (following through)

Lesson Activity: Dribbling Intro + Tectonic Plates

The students will play this game to prepare them for gameplay. This will teach them not to travel and to understand the concept of a double dribble. Dribbling will also be paired with the concept of tectonic plate movements.

Equipment Needed/Formation

- Students will work individually.
- Each student needs a basketball.

Rules

- Behind the concept of plate tectonics is the idea that the Earth's land is constantly in motion.
 - Plate tectonics are discussed more in depth in the [Resources](#) section
- Similarly, when dribbling during a game, students have to keep the ball moving.
- Students will dribble with one hand at a time.
- They are able to take two steps once they've picked up the basketball.
- They cannot stop dribbling and then start again.
- At the beginning of the lesson, demonstrate a double dribble and emphasize the importance of not double dribbling while playing basketball.
- Students are able to dribble at different stances (see modifications below).
- While students perform this activity, observations can be made.
- As students move about the court during this activity, they may get close together. When they do, incorporate the idea of earthquakes, which occur when tectonic plates get stuck from being close together.
 - Shout "Earthquake!"
 - Students will stop where they are and repeat back "Earthquake!"
 - Once the "earthquake" is completed, students will move out and resume dribbling.

Modifications

- Students can adjust their dribbling stances based on their proficiency/comfortability with the dribbling cues.
 - Basic: dribbling while standing in place
 - Moderate: dribbling while walking
 - Challenge: dribbling while jogging around the perimeter of the court

Cues

- Fingerpads
- Waist level
- Eyes up

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Lesson Activity: Shooting + Determining Precision and Accuracy

Precision and accuracy are concepts not only important to basketball, but science as well. In this activity, students will practice shooting while developing an understanding of these concepts.

Equipment Needed/Formation

- In groups of three or in pairs (depending on your preference and the total number of students and equipment), students will practice shooting.
- In order to observe progress, and adjust students' shooting placements for modifications, one hoop will be used.
- After the warm up/lead up game, pass out equipment and group students.
- Place cones at the Free Throw Line to indicate where students should start from.

Rules

- Briefly explain the difference between precision and accuracy (see the [Glossary of Terms](#) and [Resources](#) sections for more definitions and examples of these concepts). Demonstrate by making a series of shots and determining whether or not your "data" is accurate and/or precise.
 - Ex. You shoot three times and miss, but your ball was shot to the same place each time. This data is precise, but not accurate.
 - Ex. You shoot three times and make every basket. This data is accurate and precise.
 - Ex. You shoot three times and miss, with the ball going in different directions each time. This data is neither precise nor accurate.
- Students will line up with their partner(s). Groups actively shooting will be at the Free Throw Line. Other groups will line up behind the Center Circle.
- While one student shoots the ball, another student in their group will record where it was aimed/landed. Each student will have a sheet to turn in as an exit ticket. (See the [Assessment](#) for this activity.)
 - After the activity, students will determine if the "results" of their practice is precise and/or accurate.
- At least six rounds should be made, to give time to practice this skill and for modifications to be made. Each student will attempt 1-2 shots per round (adjust based on your class's timing).

Modifications:

- After the first two rounds, determine if a student needs an adjustment or challenge. Partners do not need to shoot from the same line if a modification is made for one student in a group.
 - Place a cone in the center of the front arc of the Free Throw Circle. If a student is having trouble shooting from the Three Point Line, have them move up to this point to shoot their next shot.
 - Place a cone in the center of the back of the Free Throw Circle (Three Point Arc). To provide a challenge for students, have them shoot from this point.

Cues

- Feet shoulder-width apart
- L-shelf (the shooting arm)
- Elbow in line with target
- Up and out
- Bend your knees
- Hand in the cookie jar (following through)

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Lesson Activity: “Basketball Scramble!”²

This lesson activity from PE Central (PEC) is a way to practice various skills related to dribbling, shooting, and passing. Science Skills have also been added to this idea.

Equipment Needed/Formation

- Students will be in pairs (unless there is an uneven number, in which a group of three is permitted).
- Students will line up at one end of the court in their groups. Each pair will have a ball to share.
- At midcourt, cones will be lined up with [various notecards](#). One side of the notecard is a basketball skill they will have to perform.
 - More than one pair will be going towards a cone for a card.
- Each student will be given a multiple choice [worksheet with various science questions](#). On the other side of the notecard, write a number corresponding to a science question (#1-20). Students will circle this number on their worksheet to answer at the end of class.

Rules

- At the start of the activity, one student will dribble to the midcourt line while the other student runs alongside them. At midcourt, the student with the ball will chest pass it to their partner and pick up a card at the cone.
- Once a card has been picked up, the other student will dribble back while the other runs alongside.
- Students will perform the activity on the card together. After finishing it, students will use the number on the other side of the card to circle a question on their science worksheet.
- Once students have finished with the card, they will dribble/run back to midcourt and repeat with a new card.

Cues

- Dribbling
 - Finger pads
 - Bend your knees
 - Eyes up
- Passing
 - Step into your pass
 - Follow through
 - Say the name of the person you’re passing to

Lesson Activity: “Basketball Pinball”¹: Dribbling + Lysosomes

This lesson activity from PEC focuses on guarding and dribbling. When integrated with STEM, the function of the cell’s lysosomes and cell waste will also be explored.

Equipment Needed/Formation

- Divide students into pairs. Each pair will need one hula hoop and one basketball.
- One student will have the hula hoop around their ankle and will be responsible for trying to steal the ball from their partner. The purpose of the hula hoop is to slow them down a little during the game.
- Explain that students wearing the hula hoop are acting as a lysosome in the cell, which is responsible for getting rid of waste and foreign material. The other student will have the waste (basketball). See the [Glossary of Terms](#) and [Resources](#) sections for more information about the lysosome.

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Rules

- At the start of the activity, the student with the hula hoop will try to grab the waste while the other student dribbles. If they are successful, they will drop the hoop and the students will switch roles.
- At the end of the activity, students will answer a two-question [exit ticket](#) about their role as a lysosome.

Safety

- Go over safe ways to guard and steal the ball so students are not rough with one another. Ensure that students wearing the hula hoop are careful of tripping.

Modifications

- If students are having trouble wearing the hula hoop, have them try to steal the ball without it.

Cues

- Guarding
 - Bend your knees
 - Arms in passing lane (defender)
 - Feet a little more than shoulder width apart
 - Arms length away from the person you're guarding
- Dribbling
 - Finger pads
 - Eyes up

Lesson Activity: Layup - "First to 20" + Deposition

This lesson will allow students to practice layups in preparation for basketball game play. In doing so, students will also be acting out deposition of land. A [video](#) has been included with this lesson's explanation.

Equipment Needed/Formation

- One full court
- The class will be split into two even teams.
- Each team will be running a midcourt layup drill.
- Each team starts at midcourt.
- Within their teams, each student will have a partner to complete the [assessment](#) for this activity.

Rules

- Each team will line up on each side of the midcourt line. Students will have balls to make layups with .
- The other line will be rebounding and going to the end of the opposite line to shoot.
- This process will continue until the first team reaches 20 layups.
- The teams are required to count aloud.
- By picking up the balls, and moving across the court to make a layup, this skill can be applied to the concept of deposition.
 - When land material has been eroded, wind and water can cause it to be added to other land forms. See the [Resources](#) section for more information about (geological) deposition.
 - Deposition is represented by making the lay up.

Modifications

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- Students will start by dribbling to the basket to make a layup.
- If a student is having trouble, they can walk instead of dribble to the basket.

Cues

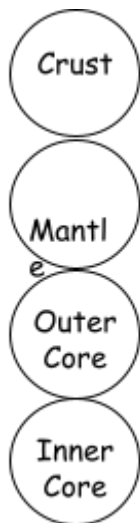
- High in the box, upper corner
- Shooting arm and knee on a string
- Lay it up
- End up under the basket

Lesson Activity: “Team Dribble Shoot and Score”² + the Earth’s Interior

This lesson from PEC will be used to combine the dribbling and shooting skills students will have practiced over the course of this unit.

Equipment Needed/Formation

- Group students into four teams. Pass out different colored jerseys for each team.
 - The [Mixtures](#) activity above can be used as a warm up for this lesson.
- One basket and a full court will be used for this game.
- Tape four different colored hula hoops together, and vertically tape them to a basket. The hula hoops will be used to represent different points for shooting: The top hoop is worth 4 points, the second hoop is worth 3 points, the third hoop is worth 2 points, and the bottom hoop is worth 1 point.
 - Add a label for each each hoop: “Crust,” “Mantle,” “Outer Core,” “Inner Core”



- See the [Resources](#) section for the connection of the hoop labels to the Earth’s composition/layers
- Behind the targets/basket, place 4 hula hoops with matching labels and colors and the stacked hula hoops.
- Scatter poly spots across the entire basketball court. There should be one per student.

Rules

- Three teams will go onto the court and find a spot. They will be playing defense.
 - During the game, they must keep one foot on this spot at all times, and not move the spot.
- The fourth team will play as offense and will line up at one end of the court.

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- In the game, the offensive team’s goal is to dribble balls down the court and make shots into the hula hoops for points. The defense players will try to take away the ball from offensive players. At least 16 balls can be in play, but the number is at your discretion.
- If a ball is shot through one of the hoops, the student will place the ball into the hoop behind the basket matching with the shot’s points.
- Place an empty bin outside of the court lines. If a ball is taken by defense, they will place the ball inside the bin.
- Once all of the balls have been placed in a hula hoop or in the bin, tally the points for the offense team, and rotate a new team into offense

Modifications

- If you have more than one court, spread students out
 - Instead of 3 defensive teams and 1 offensive team, have 1 defense team and 1 offense team per court.
 - Set up more hula hoops/bins for each basket the two teams will be using.

Cues

- Dribbling
 - Finger pads
 - Eyes up
- Shooting
 - Knees bent
 - L-shelf
 - Elbow to target
 - Up and out
 - Hand in cookie jar (follow through)

Final Lesson: Basketball Game

Equipment/Formation

- At least one full court for two half court games.
- 4 teams of 5 students
 - Each team with a different colored jersey

Rules

- After assigning teams, start with the [Mixtures Warm-Up](#)
- The teams will play a game to 10 points.
- The first team to 10 on either side will then play against each other
- See the “[The Rules and Regulations of Basketball](#)” section above for suggestions for scoring and game play.
- If the ball hits the rim on a missed shot, the defensive team has to take the ball behind the three point line to reset possession.

Cues

- Shooting
 - Knees bent
 - L-shelf
 - Elbow to target

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- Up and out
- Hand in cookie jar (follow through)
- Lay Up
 - High in the box, upper corner
 - Shooting arm and knee on a string
 - Lay it up
 - End up under the basket
- Dribbling
 - Finger pads
 - Bend your knees
 - Eyes up
- Passing
 - Step into your pass
 - Follow through
 - Say the name of the person you're passing to

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Assessment Tools

[Jump Back to Activities to Develop Skills](#)

Observational Checklist: Dribbling and Shooting

- A 1-5 scale will be used to assess students' proficiency in shooting and dribbling following teacher observation
- If a student needs improvements for certain cues, indicate so in the comment sections, along with any other observations you wish to write
- This checklist can be used for different lesson activities, and the final scale score for each skill can be averaged to determine if the student has met the objective for dribbling and shooting

- 1: The student has minimal understanding and needs improvement
- 2: The student shows understanding and partial mastery
- 3: The student understands and can apply the learned skills
- 4: The student has consistently and independently demonstrated understanding of the skill
- 5: The student demonstrates mastery

| | | Shooting Cues Feet shoulder-width apart, L-shelf (the shooting arm), Elbow in line with target, Up and out, Bend your knees, Hand in the cookie jar (following through) | Dribbling Cues Finger pads, Bend your knees, Eyes up |
|---------------------|----------------------------|---|--|
| Student Name | Scale Scores (1-5) | Shooting Comments | Dribbling Comments |
| Jessica N. | 1 2 3 4 5 1 2 3 4 5 | | |
| Mark P. | 1 2 3 4 5 1 2 3 4 5 | | |
| | | | |
| | | | |

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Worksheet for Scientific Method + Dribbling and Shooting

- What to look for in the conclusion:
 - Dribbling the ball low: less force
 - Dribbling the ball high: more force
 - Shooting the ball closer to the basket: less force
 - Shooting the ball farther from the basket: more force
- Their hypotheses are just an educated guess, so it is not expected that they guess the outcomes correctly in this section.

Name:

Partner Names:

| Station 1: Dribbling | Station 2: Shooting |
|---|--|
| <p>Task: You and your partners will be dribbling in two ways: sitting and standing. When sitting, your goal is to dribble the ball between your legs and without the ball going too high. When standing, your goal is to dribble the ball as high as your hip.</p> | <p>Task: You and your partners will be shooting the ball two ways: from the front of the Free Throw Circle and from the Free Throw Line. Get the ball through the hoop or as close to the basket as possible.</p> |
| <p>Your scientific question has been asked for you: which takes more force: dribbling the ball low (sitting) or high (standing)?</p> | <p>Your scientific question has been asked for you: which takes more force: shooting closer to or farther from the basket?</p> |
| <p>Hypothesis (your prediction):</p> <p>If I dribble the ball low, then it will take more / less / the same force. (circle one)</p> <p>If I dribble the ball high, then it will take more / less / the same force. (circle one)</p> | <p>Hypothesis (your prediction):</p> <p>If I shoot the ball closer to the basket, then it will take more / less / the same force. (circle one)</p> <p>If I shoot the ball farther from the basket, then it will take more / less / the same force. (circle one)</p> |
| <p>Experiment: It's time to test your hypothesis! Take turns with each partner doing the task. For an extra challenge, try dribbling with a different hand.</p> | <p>Experiment: It's time to test your hypothesis! Line up with your group and other groups. Shoot from closer to the basket first and then farther next. Shoot once from each line.</p> |
| <p>Results: What happened in your experiment? Describe the amount of force you used for sitting and standing.</p> | <p>Results: What happened in your experiment? Describe the amount of force you used at each line.</p> |

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| | |
|--|--|
| <p>Conclusion: Summarize what happened during your experiment. Was your hypothesis correct?</p> | <p>Conclusion: Summarize what happened during your experiment. Was your hypothesis correct?</p> |
|--|--|

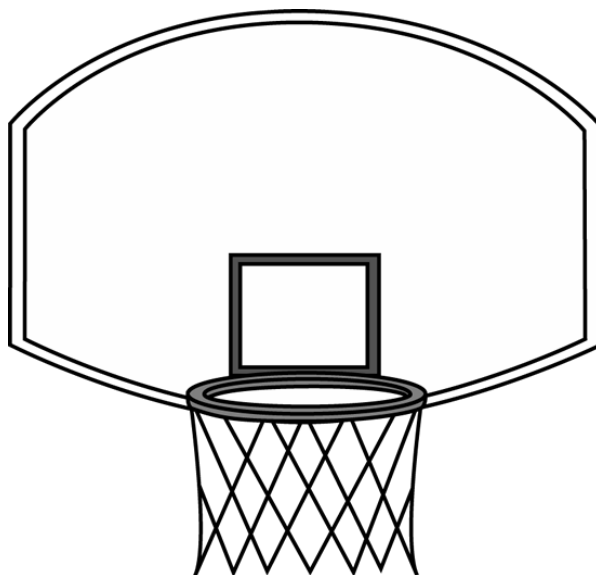
Exit Ticket for Shooting + Precision/Accuracy

- Students work in pairs or small groups
- During their activity, they should mark where their balls landed/where their shots were made
- After the end of the activity, they should determine if their “data” is precise and/or accurate (or neither).
- This exit slip can be a half sheet that students keep with them during their shooting activity.
- What to look for:
 - Precise data will have shots made in the same area more than once.
 - Accurate data will have shoots made that went through the hoop.
 - Verify students’ understanding by determining if their conclusions about the data match their drawings.
- Use the marked shots to determine if students were able to shoot from the Free Throw Line 70% of the time.

Name:

Partner Name(s):

Partner Instructions: Using a special shape, mark where your partner made shots. If the ball did not touch or go near the headboard, mark the direction of where the ball landed. If your partner makes a basket, draw the shape in the net.



After the activity: Look at where your partner marked your shots.

Do you have any accurate data? (Circle one) Yes or No
 How do you know? (Explain in one sentence)

Overall, is your data precise? (Circle one) Yes or No
 How do you know? (Explain in one sentence)

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Science Question Worksheet for “Basketball Scramble”²:

Questions were retrieved from HelpTeaching.com.⁵ Feel free to coordinate with the fifth grade science teachers at your school to tailor questions to students’ current units in class. An answer key has been provided after the worksheet.

Basketball Scramble!

Names:

Instructions: Collect as many basketball skill cards as you can! After doing the skill on the card, use the number on the back to circle the number of a science question below. At the end of class, you and your partner will answer the circled questions together.

1. Students notice that the fall leaves of sugar maple trees turn red, but the leaves of the black oak trees turn brown. The students are making an

- a) observation
- b) a prediction
- c) an inference
- d) a conclusion

2. A testable possible answer to a scientific question is a(n) _____.

- a) hypothesis
- b) conclusion
- c) evidence
- d) criteria

3. Scientists use the scientific method to find the answers to questions. When planning a scientific investigation, what is the first thing scientists do?

- a) conduct the experiment
- b) plan the experiment
- c) state the hypothesis
- d) research the problem

4. The molecules in a liquid are:

- a) closer together than in a solid and further apart than in a gas
- b) are spaced the same as in solids and gases.
- c) closer than in gases but further apart than in solids
- d) none of the above

5. The process by which a liquid changes to a gas is called _____.

- a) condensation
- b) evaporation
- c) precipitation
- d) transpiration

6. The process of obtaining information by using your senses is called

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- a) an observation
 - b) a scientific method
 - c) an inquiry
 - d) a conclusion
7. A decision you make based on information is a(n) _____.
- a) conclusion
 - b) hypothesis
 - c) investigation
 - d) evidence
8. Anything that takes up space and has mass is called _____.
- a) solid
 - b) color
 - c) matter
 - d) atoms
9. Where do plant cells store food, water, and wastes?
- a) nucleus
 - b) chloroplast
 - c) vacuole
 - d) cell membrane
10. Condensation is when a liquid changes to a gas.
- a) True
 - b) False
11. Which of the following is a characteristic of liquids?
- a) molecules are tightly packed
 - b) takes the shape of its container
 - c) constantly keeps its shape
 - d) molecules are spread far apart
12. A cell is the
- a) storage space
 - b) tiny unit of a living thing
 - c) cell energy processor
 - d) stiff outer layer of a plant cell.
13. Which plant cell part gives the plant support and is not part of animal cells?
- a) chloroplast
 - b) cytoplasm
 - c) cell membrane
 - d) cell wall
14. Ice is the form of water that has particles moving the _____.
- a) slowest
 - b) fastest

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15. Circle the 3 most common forms of matter on Earth.
- a) solid
 - b) plasma
 - c) liquid
 - d) gas
16. A procedure carried out to gather data about an object or event is a/an _____.
- a) inquiry
 - b) hypothesis
 - c) investigation
 - d) experiment
17. A pencil is a _____.
- a) solid
 - b) liquid
 - c) gas
 - d) plasma
18. An example of a gas is _____.
- a) chocolate syrup
 - b) a rock
 - c) a pencil
 - d) helium
19. What part of the plant cell holds the chlorophyll?
- a) chloroplast
 - b) vacuole
 - c) cell wall
20. An example of a liquid is oil.
- a) True
 - b) False

Answer Key for Science Worksheet

- 1. a
- 2. a
- 3. d
- 4. c
- 5. b
- 6. a

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7. a
8. c
9. c
10. b
11. b
12. b
13. d
14. a
15. a,c,d
16. d
17. a
18. d
19. a
20. a

Notecards for “Basketball Scramble”²

- Print these cards to use during the “Basketball Scramble”² activity. After printing, write numbers on the back of the cards between 1 and 20 for students to match with their science worksheet.

| | | |
|---|---|--|
| Dribble in place 10 times | Dribble between your legs 5 times | Dribble around your partner |
| Overhead pass the ball to your partner 6 times | Bounce pass the ball to your partner 10 times | Dribble figure eights between your legs 2 times |
| Roll figure eights between your legs 5 times | Dribble the ball from standing to laying to standing 2 times | Dribble around your body while sitting |

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| | | |
|---|--|---|
| <p>Chest pass the ball 10 times</p> | <p>Do 20 squats while holding the ball</p> | <p>Do 5 twisters: circle the ball around your head, around your waist, around your ankles, and back up to the top</p> |
| <p>Dribble the ball between your hands 10 times</p> | <p>Shoot the ball in place with your dominant hand 5 times</p> | <p>Shoot the ball in place with your non-dominant hand 5 times</p> |
| <p>Dribble and shoot in place 5 times</p> | <p>Do 10 sit-ups with the ball</p> | <p>Dribble in place 15 times</p> |

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Exit Ticket “Basketball Pinball” + Lysosome Activity

- Use the last 5 minutes of class after this activity to pass out one paper per student.
 - What to look for:
 - Question 1: To grab/get rid of waste/trash/garbage. To be the lysosome
 - Question 2: so the cell isn't full of waste/trash/garbage.
-

Lysosomes and the Cell

Name:

- 1) When you wore the hula hoop, what was your duty?

 - 2) Why do you think this job is important to a cell?
-

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Lay Up Assessment

Layup Partner Checklist

Partner's name: _____

Date: _____

| Cues | Yes | No |
|---|------------|-----------|
| Eyes on target | Yes | No |
| High in the box upper corner | Yes | No |
| The knee and arm on the side you're shooting go up as if they were being pulled by a string | Yes | No |
| Use the backboard | Yes | No |
| End up under the net | Yes | No |

Your name: _____

Total: _____

Total: _____

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Science Questions for If-Then³ Warm-up

Correct answers have been bolded. After students have performed each question, make sure to confirm the correct answer. Feel free to replace the skills/activities students do for their answer.

- If a gas' molecules move slower than a liquid's, then sit down a dribble on your left side. **If they are faster, then remain standing and dribble to your left.**
- **If plant cells can do photosynthesis, then dribble and count to three.** If animal cells can do photosynthesis, then dribble and count to four.
- If lysosomes store food, then hold the ball to your chest and stand. **If lysosomes do not store food, then hold the ball to your chest and sit.**
- **If a hypothesis is an educated guess, then sprint to midcourt.** If a hypothesis is a question, then stay where you are.

Partnered Activities

- If high temperatures cause freezing, then bounce pass the ball to your partner. **If low temperatures cause freezing, then chest pass the ball to your partner.**
- **If volcanoes are formed because of tectonic plates, then the shorter person should dribble around their partner.** If volcanoes are not formed because of tectonic plates, then the taller person should dribble around their partner.
- **If the Earth's land is always moving, then both partners skip to midcourt.** If the Earth's land is usually very still, both partners run to midcourt.

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Glossary of Terms

[Jump Back to the Activities to Develop Skills section](#)

[Jump to the Resources Section](#)

accurate (accuracy) - when data is accurate, points have met a certain standard or threshold. For example, with basketball, successfully shooting the ball into the basket is accurate.

conclusion - a summary of what happened during an experiment and whether or not the initial prediction about the results were correct

deposition - (as it relates to geology) when matter is added (deposited) to landforms over time

gas - matter in the gas phase contains molecules that are constantly moving. Unless it is contained (ex. a gas in a jar with a lid), it will continue to expand. Its molecules are very spread out and far apart.

heterogeneous - when the components of a mixture are not evenly distributed. These components can be differentiated from one another in this type of mixture. (See Chemistry for Kids resource below.)

homogeneous - when the components of a mixture are evenly distributed. These components cannot be differentiated from each other in this type of mixture. (See Chemistry for Kids resource below).

hypothesis - an educated guess or prediction about what will happen during an experiment

liquid - this phase of matter is fluid, and will take the shape of its container. Unlike a solid, its molecules are more spread out.

lysosome - eukaryotic cells have organelles called lysosomes which are responsible for getting rid of waste and foreign material in the cell.

mixture - the combination of two or more different components/substances.

precise (precision) - when data is precise, points are near one another. In terms of basketball, repeatedly shooting the ball to a similar area shows precision. For example, if the ball hits the right side of the headboard for three shots, this is precise data. (For the data to be precise AND accurate, multiple baskets would have to be made).

solid - when matter is in the solid phase, its molecules are close together. An object will take on a fixed shape.

Resources

[Jump Back to the Activities to Develop Skills section](#)

[Accuracy and Precision](#) - This resource gives a mathematical explanation of the difference between accuracy and precision. It uses the great visual aid of dart throwing to explain these concepts, and even provides students a way to remember the difference between the two terms.

[cell: lysosome - Students](#) - Britannica Kids provides a brief description and image of the cellular organelle, the lysosome.

[Chemistry for Kids: Chemical Mixtures](#) - This link is another kid-friendly resource that explains chemical mixtures. Heterogeneous and homogeneous mixtures are explained thoroughly, with more examples to choose from to use during activities. Solutions are also mentioned and explained on this page.

[Composition of the Earth](#) - This link gives descriptions of the Earth's layers, as well as a diagram.

[Deposition \(geology\) facts for kids](#) - This link gives a brief description of deposition as it applies to geology.

[The physics of basketball and brackets](#) - This link is tailored towards adults. It provides an explanation about the connection between physics (applied force and gravity) and various basketball skills (dribbling, shooting, etc.).

[The physics of free throw shooting](#) - This link looks specifically at the physics behind shooting. It gives explanations for different factors to shooting, such as angles and applied force.

[Plant vs animal cells review](#) - This article from Khan Academy compares and contrasts the organelles of plant and animal cells.

[Plate Tectonics](#) - This source goes in depth about the Earth's movement, tectonic plates, and the different types of plate boundaries.

[The Scientific Method](#) - This resource goes more in depth about the scientific method for kids. The lesson including the scientific method above modified the sequence of steps to fit the PE setting. This page provides more about each step.

[States of Matter](#) - This page provides definitions and examples for the main three phases of matter: solid, liquid, and gas. It also gives information about the two less common states: plasma and beam. As this resource is geared towards kids, feel free to provide this link to your students to deepen their understanding of the subject outside of class.

[Tectonic Plate Facts](#) - This site gives an explanation about the concept of tectonic plates, and what physical structures/phenomena that can occur because of their shifting (volcanoes, earthquakes, tsunamis)

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<https://education.gmu.edu/health-and-physical-education/med-physical-education>

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[Youth Guidelines - Rules & Standards](#) - The “Introduction to Basketball” section of this unit plan highlighted the rules and guidelines from this resource for basketball instruction. This link goes more in depth about the rules for youth basketball and can be used to modify any of the materials provided.

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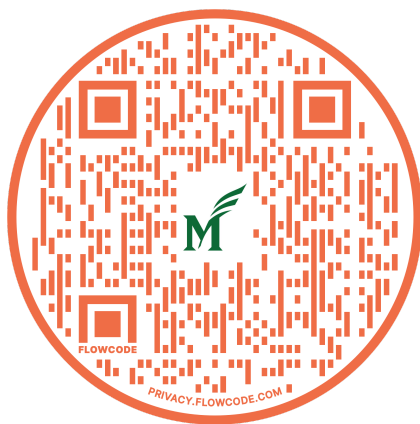
<https://education.gmu.edu/health-and-physical-education/med-physical-education>

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*If you have a printed copy of the unit plan, scan this code to access the electronic version and the links embedded in it.



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