Youth Assist
Tracker Challenge

Empower Your STEAM Learning
Youth Assist Tracker Challenge

STEAM + Community Learning

The NBA, State Farm®, and Learn Fresh are proud to share this five-lesson experience with students and educators across the United States. Designed in the spirit of the State Farm Assist Tracker, which generates assists to the community from assists made on the court, the following lessons introduce students to the real-life applications of STEAM topics, while also encouraging them to be better citizens in their schools and local communities.

We encourage all educators to complete the following five STEAM-based lessons, while also implementing the Student Assist Tracker in their classrooms. All participants can also follow along online, as the State Farm Assist Tracker logs the league’s current assist total at stats.nba.com.

The five lessons include the following themes:

**LESSON 1**  
**SCIENCE**  
Energy on the Court  
**COMMUNITY**  
Energy in the Community

**LESSON 2**  
**TECHNOLOGY**  
Timing the Sport  
**COMMUNITY**  
A Deadline to Serve

**LESSON 3**  
**ENGINEERING**  
Building a Better Arena  
**COMMUNITY**  
Crafting a Cleaner School

**LESSON 4**  
**ART**  
Design with Thirds  
**COMMUNITY**  
Draw a Helping Hand

**LESSON 5**  
**MATH**  
Tracking Excellence in the Game  
**COMMUNITY**  
Tracking Excellence in the Community

The Student Assist Tracker

On the last page of this packet, you will find a document that is entitled “Student Assist Tracker.” We encourage every educator to post this sheet on the wall of their classroom and keep a tally of instances of excellence in the classroom. At Learn Fresh, we look out for displays of great teamwork, grit, integrity, and compromise in our programs. We encourage you to seek out these “Student Assists” as well. They may look like:

- A student helping their classmate understand a difficult subject in your class.
- A student picking up a piece of trash from the ground and placing it in the garbage.
- A student allowing a peer to speak first during a class discussion.

At the conclusion of your school’s participation in this program, we’ll ask each building to report the total number of Student Assists tallied across all participating classes, which will be included in your school’s application to win financial support for STEAM learning from the NBA and State Farm.
Energy on the Court

Energy is a fundamental principle of physics, defining how we initiate and sustain activity. Very simply put, the concept of energy helps us to understand how the physical world changes, moves, and evolves. Every day, you use energy in different forms to help execute basic tasks. It takes energy to walk to class, do your homework, and clean your room.

When you watch a basketball game, you may not consider how science relates to play on the court. However, scientific concepts like energy play an important role in allowing your favorite players to shoot, pass, and dunk.

Let's explore a few different types of energy and how they are used in your everyday life.

**EXERCISE 1.1**

**POTENTIAL ENERGY**

is stored energy that an object possesses because of its position.

Try doing a jumping jack! When you are at your highest point in the air, your body possesses a significant amount of potential energy, as gravity prepares to pull you back to the ground.

1. Consider the position of the player in the photo to the left. Do you believe that this player has a significant amount of potential energy in this position? Why or why not?

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**EXERCISE 1.2**

**KINETIC ENERGY**

is the energy possessed by a moving object.

Now take a quick jog down the hallway. As your body continues its motion across the floor, it possesses significant kinetic energy.

2. Consider the position of the player in the photo to the left. Do you believe that this player has a significant amount of kinetic energy in this position? Why or why not?

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Now that you understand the difference between potential and kinetic energy, discuss how your body uses each form of energy during the school day. First consider in groups of four, and then share out with your whole class.
Energy in the Community

Our use of energy allows us to move around the world each day. In the first half of this lesson, we've considered how some specific types of energy apply to our body and the game of basketball. Now let's consider the concepts of stored and active energy in a different context.

Every day, you make choices about how you engage with your peers and larger school community. As an important member of this community, the choices that you make can have a very positive impact on those around you! Throughout these lessons, you will have an opportunity to consider how you can do more and do better for your school.

Before we move forward with some new ideas for how you can improve the community, let's take stock of how you already provide “assists” for those around you.

**Exercise 1.3**

1. Consider the things that you already do to help improve your school. Maybe you always hold the door for your classmates or help them clean up after a lesson. If you consider any of these actions to be habit, write them below.

   - I always _______________________
   - I always _______________________
   - I always _______________________
   - I always _______________________
   - I always _______________________

   THINK OF THESE ACTIONS LIKE KINETIC ENERGY! THEY'RE IN MOTION AND ARE ALREADY PROPELLING YOU TO BE A BETTER MEMBER OF YOUR COMMUNITY.

**Exercise 1.4**

2. Now consider the “assists” that you sometimes provide to your community, or that you think about providing, but don’t always do. Maybe your friend has forgotten their lunch and you consider sharing yours, but decide against it because you are hungry too.

   - I think about _______________________
   - I think about _______________________
   - I think about _______________________
   - I think about _______________________
   - I think about _______________________

   THINK OF THESE ACTIONS LIKE POTENTIAL ENERGY! YOU CONSIDER THEM AND STORE THEM INTERNALLY, BUT DON’T ALWAYS ACT ON THEM.

As you look to provide more assists to your class and school community, you will want to convert more of these potential actions to real, ongoing habits!
LESSON 2

Technology

Empower Your STEAM Learning
Timing the Sport

Technology has played a significant role in the evolution of the NBA, its teams, and its players. Collecting stats, tracking player fitness, improving the fan experience in-arena, and many more parts of the sport have been impacted by an investment in, and improvement of, technology. Technology has also allowed fans to become closer to the sport, as game tracking, highlights, and analysis of gameplay are available at unprecedented levels of depth.

Although there has been significant growth in basketball-driven technology in the 21st Century, one of the game’s first and most critical advancements far preceded the digital age in which we now live. In fact, it was first used in 1954!

This innovation was the shot clock - a simple, but critical addition that sped up the game of basketball and changed how the game was played. The clock limited the amount of time available to make a shot to just 24 seconds, a change which greatly altered teams’ offensive and defensive strategies, and increased the popular appeal of the game.

Consider the following questions, using an online search for answers that you need to look up.

**Exercise 2.1**

1. What was the lowest score in NBA history, before the shot clock was invented? Which teams participated in this game?

2. Who originally invented the shot clock? How did they decide to limit it to 24 seconds?

3. What specific problem did the new shot clock solve for NBA teams in the 1950s?

4. New technology is often implemented to solve a specific problem or pain point, as was the case with the shot clock. What is a new technology that has solved a unique challenge, either in basketball or in your everyday life?

5. Now consider your own school! What is a specific problem or challenge in your building that could be aided by a new technology? What might that look like?
A Deadline to Serve

Each day in school, you encounter your own version of the shot clock! When you switch from one class to the next, you are usually given a specific amount of time - 2, 3, 5 minutes - to get from one classroom to the next. At a very basic level, your clock and the NBA's shot clock serve a very similar purpose. They help to keep the pace of an experience moving forward, so that the action (your next class) can quickly continue!

As we pursue our mission of collecting as many community assists as possible, consider how you can use this time effectively to help improve your school's community. Just like a basketball team on offense, how do you use this time productively to help achieve your goal?

Below are some scenarios that can happen during your “shot clock” - transition time from one class to the next. When answering these questions, consider how you can use your time most productively! Discuss each in small groups and record your answers below.

1. Math class is over and it's time to move to your next class. You notice some students are playing around in the hallway, not heading to class, and they want you to join in on the fun. Since you only have four minutes in between classes to go to your locker, should you stop or keep moving?

   ____________________________________________

2. During your transition time, you see a classmate bullying another student. What can you do to help the situation, given the short amount of time that you have?

   ____________________________________________

3. While waiting outside of your next class, you notice that a friend is having a hard time getting into their locker. How could you help your friend?

   ____________________________________________

4. A student made a mistake and knocked the hallway trash can over. The student didn't think anyone saw him, so he left the scene. What could you do to help the situation?

   ____________________________________________
LESSON 3

Engineering

Empower Your STEAM Learning
Building a Better Arena

As we look to the future of engineering, environmentally-conscious decision-making continues to increase in importance. The specific field of environmental engineering helps to shield humans from the adverse efforts of pollution, while improving the sustainability of manufacturing and development. These experts use the principles of engineering, soil science, biology, and chemistry to develop practical solutions to key environmental challenges. They are involved in efforts to improve recycling, waste disposal, public health, and water and air pollution control.

A key certification which many new properties aim to receive is LEED, which stands for Leadership in Energy and Environmental Design. This certification program is focused primarily on commercial-building projects and awards levels of environmentally-friendly status, based upon a points system. The more points you earn, the higher your rating. In the NBA, the Sacramento Kings’ new arena has become a pioneering venue in the sports world, largely due to its unprecedented LEED rating.

Take a look at the arena’s LEED scores below, compared with the maximum possible points earned, and complete the chart.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>PTS. EARNED / TOTAL PTS.</th>
<th>WHAT % OF POINTS DID THE ARENA EARN?</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUSTAINABLE SITES</td>
<td>22/26</td>
<td></td>
</tr>
<tr>
<td>PROTECTING NATURAL HABITAT, REDUCING THE AMOUNT OF UP-LIGHTING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WATER EFFICIENCY</td>
<td>6/10</td>
<td></td>
</tr>
<tr>
<td>REDUCING WATER WASTE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENERGY &amp; ATMOSPHERE</td>
<td>27/35</td>
<td></td>
</tr>
<tr>
<td>MAKING THE BUILDING MORE EFFICIENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATERIALS &amp; RESOURCE</td>
<td>7/14</td>
<td></td>
</tr>
<tr>
<td>RECYCLING AND WASTE MANAGEMENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INDOOR ENVIRONMENTAL QUALITY</td>
<td>11/23</td>
<td></td>
</tr>
<tr>
<td>THE QUALITY OF CONDITIONS INSIDE OF A BUILDING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INNOVATION</td>
<td>6/6</td>
<td></td>
</tr>
<tr>
<td>CREATIVITY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REGIONAL PRIORITY CREDITS</td>
<td>4/4</td>
<td></td>
</tr>
<tr>
<td>EXTRA BONUS POINTS ADDRESSING ENVIRONMENTAL PRIORITIES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OVERALL LEED SCORE</td>
<td>83 TOTAL POINTS</td>
<td></td>
</tr>
</tbody>
</table>

LEED status is awarded on the following scale: Certified - 40+ points; Silver - 50+ points; Gold - 60+ points; Platinum - 80+ points. Considering this information, which LEED certification level did the Kings’ arena receive?

Let’s learn more about the Sacramento Kings’ arena. Read the article available at www.bit.ly/kingsarena and fill in the blanks below.

1. The Kings’ arena is the first ______________ arena in the world to be completely solar powered.

2. The arena’s farm-to-fork concessions are unique in the sports world, with _____ % of all ingredients sourced from within _____ miles of the facility.

3. Unserved food is redistributed to serve the community through a local food _____________.

4. The arena’s court includes pieces of ____________, donated by fans.

DID YOU KNOW: The arena’s air conditioning system features under-seat vents, allowing the building’s staff to quickly adjust the temperature of the arena. This feature is the first-of-its kind for a sports and entertainment venue, anywhere in the world!
As you have learned, the Sacramento Kings constructed an environmentally-friendly arena that plays a key role in serving the team's home city. Now let's consider how you can help your school make similar choices, to better serve your local community.

### Lend your school a “Student Assist”!

<table>
<thead>
<tr>
<th>Exercise 3.3</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How could you make a change or addition to your school to better preserve the natural habitat around the building?</td>
</tr>
<tr>
<td>2</td>
<td>How could you make a change or addition to your school to save more water?</td>
</tr>
<tr>
<td>3</td>
<td>What changes could you make to your building to save more energy and electricity?</td>
</tr>
<tr>
<td>4</td>
<td>What could you do to help your school’s community conserve waste and recycle more?</td>
</tr>
<tr>
<td>5</td>
<td>What could be done to improve the quality of food served at your school?</td>
</tr>
</tbody>
</table>
Lesson 4
Art
Empower Your STEAM Learning
Art and design are all around us! They can be found in the songs you hear on the radio or the murals that you see on the side of the highway. They can also be found in the chair that you’re sitting in and the school building that you attend each day. In many ways, art and design are vital for the successful application of other topics covered in this packet. Art is often designed with a careful, even mathematical eye.

The Rule of Thirds is a simple technique used by artists and designers to achieve maximum visual appeal, based upon the tendencies of the human eye. The rule divides a visual creation into three rows and three columns, ensuring that the viewer’s focus is drawn to the most critical parts of the design. These most important elements are usually aligned with the lines and their intersection points.

This simple concept can be applied to the logos above. Let’s explore how one of these logos aligns with the Rule of Thirds grid.

**Exercise 4.1**

1. What do you notice about how the logo aligns with the grid, including its lines and intersection points?

2. After looking at the logo with the grid, do you feel like the Rule of Thirds was effectively used to design this logo?
As part of the Youth Assist Tracker Challenge, you have been tasked with being the best citizen possible in your class and school. This has challenged you to find new ways to serve your community!

Think and discuss the following questions in groups of four.

**EXERCISE 4.2**

1. **What types of actions have you taken to improve your school community? What are some images that represent these actions?** (Ex. A recycling sign, if you’ve helped to clean up trash at your school.)

2. **Where have these actions taken place? What do those places look like?** (Ex. You have helped to clean up trash in the cafeteria, and the cafeteria’s walls are painted blue.)

**EXERCISE 4.3**

Now let’s design! Using the Rule of Thirds grid below, design a custom logo for the Youth Assist Tracker Challenge at your school. In doing so, consider your answers above, your school’s colors and mascot, and the overall purpose of the Youth Assist Tracker Challenge.
Tracking Excellence in the Game

In the NBA and WNBA, statistics are used to track the performance of every team and player. All athletes are working towards personal and team goals, and the use of statistics allows them to know how close they have come to achieving them.

The NBA now collects player tracking data, using new camera-based technology, in all 29 arenas. Started in the 2013-14 season, the initiative has allowed for in-depth data collection and has enhanced the league's ability to create and use advanced metrics. The addition of these metrics has been a huge development for fans who want to understand the game on a deeper level, as well as for teams that want more information about a player's value on the court.

The league has developed Player Impact Estimate (PIE) as the ultimate measure of an athlete's overall statistical contribution during games. The formula for PIE factors in most basic statistics that a player could earn during gameplay, and compares them against the total statistics earned for all players in the games that they play. Let's explore!

First, let's look up stats from the first game of the 2019-20 NBA season, featuring the New Orleans Pelicans and Toronto Raptors. You can find stats from the game at www.bit.ly/firstgamestats. Pick one player from the game and record their stats in the chart below.

<table>
<thead>
<tr>
<th>PLAYER NAME:</th>
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<tbody>
<tr>
<td>PTS</td>
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<tr>
<td>___</td>
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</tbody>
</table>

Now let's plug this data into the PIE formula, listed below. The data for all players in the game is already listed for you.

\[
\text{PIE} = \left( \frac{\text{PTS} + \text{FGM} + \text{FTM} - \text{FGA} - \text{FTA} + \text{DREB} + \left( \frac{1}{2} \times \text{OREB} \right) + \text{AST} + \text{STL} + \left( \frac{1}{2} \times \text{BLK} \right) - \text{PF} - \text{TOV} }{208 + 75 + 41 - 186 - 55 + 70 + \left( \frac{1}{2} \times 33 \right) + 49 + 19 + \left( \frac{1}{2} \times 13 \right) - 50 - 35} \right)
\]

Time to calculate! Once you place all data into the formula, use a calculator to determine your player's PIE. Remember to use the correct order of operations! (HINT: START WITH THE DATA IN THE PARENTHESES!)

\[
\text{PIE} = \left( \frac{\text{PTS} + \text{FGM} + \text{FTM} - \text{FGA} - \text{FTA} + \text{DREB} + \left( \frac{1}{2} \times \text{OREB} \right) + \text{AST} + \text{STL} + \left( \frac{1}{2} \times \text{BLK} \right) - \text{PF} - \text{TOV} }{208 + 75 + 41 - 186 - 55 + 70 + \left( \frac{1}{2} \times 33 \right) + 49 + 19 + \left( \frac{1}{2} \times 13 \right) - 50 - 35} \right)
\]

How does your selected player's PIE compare to last year's NBA leader among everyday players, Giannis Antetokounmpo, whose PIE per game was 21.8?
Tracking Excellence in the Community

First, we need to consider what to include!

As you have learned, every player’s statistical impact is measured during every NBA game. What if we could use a similar formula to help measure our own contribution to the school?

Considering how the PIE formula rewards NBA players for making a positive impact during gameplay, let’s build a Community Impact Estimate (CIE) that measures a student’s overall contribution to your school.

EXERCISE 5.4

On the lines below, list six, simple positive actions that you can achieve everyday to impact your school.

1 ___________________________ 4 ___________________________
2 ___________________________ 5 ___________________________
3 ___________________________ 6 ___________________________

Now list four actions that you could take, which would not help or could potentially harm your school.

1 ___________________________ 3 ___________________________
2 ___________________________ 4 ___________________________

EXERCISE 5.5

Now let’s build a formula to measure your impact on the school’s community, in comparison to the overall impact of everyone in your school. As you write your formula, consider how the NBA gave (added) credit for positive actions taken during gameplay, removed (subtracted) credit for negative actions, and weighted some actions differently using multiplication. Use this approach in your formula.

CIE = 

What do the actions included in your CIE say about what you value in yourself, and in your classmates?

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________
Student Assist Tracker

Record a tally below, each time a student earns a “Student Assist.” Assists should be awarded whenever a student goes **above and beyond** to be a great citizen in your class. Every assist recorded will count toward your school’s overall total.

<table>
<thead>
<tr>
<th>STUDENT NAME</th>
<th>NUMBER OF ASSISTS</th>
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**DEADLINE TO EARN STUDENT ASSISTS:**
As you work through the Youth Assist Tracker Challenge curriculum, reference this sheet for answers to each lesson. All community questions are open response, meaning that students’ opinions and beliefs should drive their responses to the questions.

### Lesson 1
1.1 The image in Exercise 1.1 features Vince Carter, suspended in the air before a dunk. Students’ replies should identify that Carter possesses potential energy because of the position of his body. He has leapt into the air, and is about to be pulled back to the ground by gravity.

1.2 The image in Exercise 1.1 features Chris Paul, driving across the court with the basketball. Students’ replies should identify that Paul possesses kinetic energy, as his body is engaged in continuous motion across the court.

### Lesson 2
2.1.1 The lowest scoring game in NBA history occurred on November 22, 1950, when the Fort Wayne Pistons outscored the Minneapolis Lakers, 19-18.

2.1.2 The NBA’s shot clock was originally invented by Danny Biasone, owner of the Syracuse Nationals. He noticed that each team took about 60 shots per game, which equals 120 total. Biasone divided the length of the game (48 minutes = 2,880 seconds) by 120 shots. The result was 24 seconds per shot.

2.1.3 The implementation of the shot clock prevented teams from stalling the game, once they took the lead. It limited the amount of time that teams had to score a basket.

2.1.4 This question is an opinion question and may be answered at the students’ discretion. The answer will depend upon each student’s unique interests and challenges.

2.1.5 This question is an opinion question and may be answered at the students’ discretion. The answer will depend upon each student’s unique interests and challenges.

### Lesson 3
3.1 \[
\frac{22}{26} = 84.6\%; \quad \frac{6}{10} = 60\%; \quad \frac{27}{35} = 77\%; \quad \frac{7}{14} = 50\%; \quad \frac{11}{23} = 47.8\%; \quad \frac{6}{6} = 100\%; \quad \frac{4}{4} = 100\%
\]
The Sacramento Kings’ arena received Platinum LEED certification.

3.2 Blank #1 = indoor; Blank #2 = 90%; Blank #3 = 150 miles; Blank #4 = bank; Blank #5 = shoes

### Lesson 4
4.1.1 Students may notice that the lines highlight several key parts of the design, including the top and bottom of Logoman’s body, and the beginning of the text. They may also notice that the design strongly places key parts of the text in the central area of focus.

4.1.2 Students should generally agree that the logo’s design effectively uses the Rule of Thirds concept, as many key elements of the logo are clearly aligned with the grid. They may also have opinions about ways that the logo could more strongly use this concept, which you should entertain.

### Lesson 5
5.1-3 The responses to all of these questions are completely dependent upon which player the student selects. Exercises 5.1 and 5.2 simply require students to correctly record data from the link provided. Exercise 5.3 requires students to effectively use the correct order of operations. As such, they should do multiplication first within the parentheses, then total the numerator and denominator, then divide and compare against Giannis Antetokounmpo’s percentage from last season.