



NAME

ARIZONA DIAMONDBACKS

SCIENCE OF BASEBALL



PRESENTED BY

RESOLUTION

C O P P E R

STUDENT STEM WORKBOOK

Program Overview



ScienceSport.org



www.dbacks.com/stem

The Science of Sport develops STEM curriculum and provides programming for all learners. We bring math and science to life through hands-on learning activities using sports examples and provide direct services to teachers and students. The different services include youth Summer Camps, Field Trip Days, STEM Showcases, After School Programs, STEM Activity Bags, Teacher Workshops, Educational App called STEMadium, and Virtual programming.

The Arizona Diamondbacks STEM Activity Workbook focuses on providing engaging hands-on learning opportunities for teachers to provide to their students. These STEM activities have an emphasis on family engagement, social-emotional learning, mental health, sustainability, and STEM education. Students and families will use the materials and sporting equipment to complete the different activities and worksheets.

The mission of the Arizona Diamondbacks Foundation is to support three main areas of need: homelessness, indigent healthcare and children's programs of all types, including education and youth baseball and softball field building and renovation, outreach programs and equipment. In addition, the Foundation has created strategic programs that address the needs of our community including veterans, police, teachers, firefighters and first responders.

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Growth Mindset

Description: A growth mindset believes in the power of yourself and your brain. A growth mindset is all about a person's attitude when facing challenges and processing failures, and how they adapt and respond to setbacks.

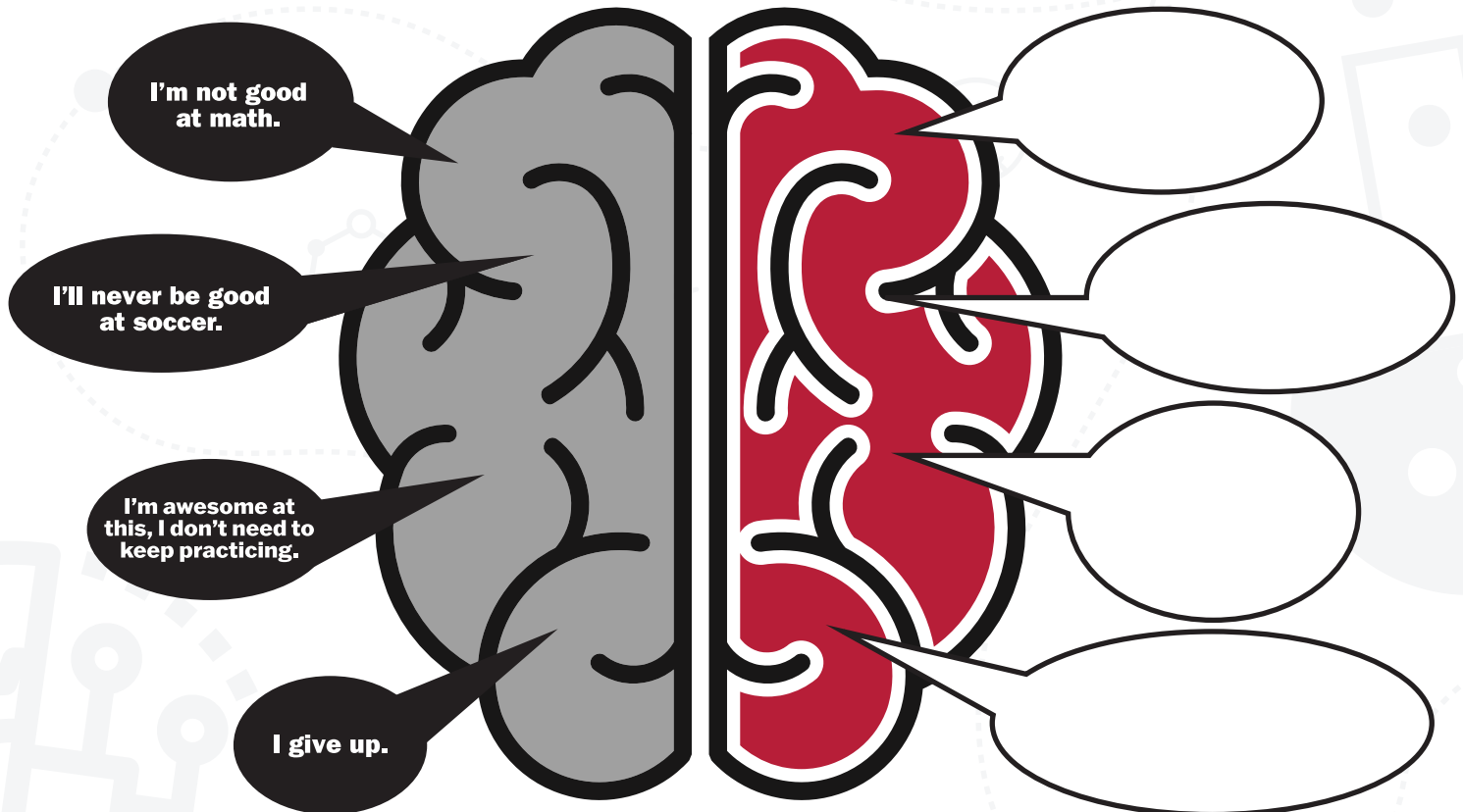
Activity: In this lesson, you will learn the difference between a Growth Mindset and a Fixed Mindset and complete a goal-setting activity.

Part 1: Thinking with your growth mindset mind, fill in the blanks below with the goal of helping you change your fixed mindset thoughts.

Part 2: Set one goal for yourself using the table below.

FIXED MINDSET

GROWTH MINDSET



List one goal that you want to accomplish below.	What steps will you take to accomplish your goal?	How will you know when you have accomplished your goal?

SPECIFIC



What do you want to do?

MEASURABLE



How will you know when you've reached it?

ACHIEVABLE



Is it in your power to accomplish it?

REALISTIC



Can you realistically achieve it?

TIMELY



When exactly do you want to accomplish it?



Breathwork

Description: Think of your breathing as either coffee, water, or tea. These 3 categories are based on the way you'd like to feel and each has its own specific techniques.

Coffee

is up-regulating, wakes you up, and prepares your body for activity and exercise.

Water

is balancing and is always a good choice, day or night.

Tea

is down-regulating, relieves stress, and can help put you to sleep.

Breathing Category	 Coffee / Pre-Game	 Water / In-Game	 Tea / Post-Game
Why practice it?	ENERGIZING Elevates energy and focus Pre-Game readiness	BALANCING Gives a balanced and refreshed mood Calm you down during a stressful event like a game	CALMING For stress reduction and to sleep better Navy seals use for focus and stress reduction
The Science	 Boosts your heart rate and energy levels	 Lowers heart rate	 Strongly lowers heart rate and soothes nervous system
Technique Name	Breath of Fire	Ocean Breathing	Box Breath
How to practice	Sharp exhales through nose, like a mini sneeze. Lips sealed. Do 30 count x 3	4 count inhale through nose 4 count exhale through nose Repeat x 10	4 count inhale through nose 4 count hold 4 count exhale through nose 4 count hold Repeat x 10



Game Time Tracking

Activity: Answer the question below.

What was the starting time of the game?

What was the ending time of the game?

How many people would you guess are in attendance at tonight's game?

At the end of the 7th inning, the announcer will announce the attendance.
How many people are at tonight's game?

How many strikeouts do you predict the D-Backs starting pitcher will pitch in the first inning of today's game? (fill out the chart and find the difference from the actual number.)

STRIKEOUT PREDICTION	ACTUAL # OF STRIKEOUTS	DIFFERENCE



What is the geometric shape of the following items on the baseball field?

Choose from: Circle, Square, Rectangle and Pentagon

1st Base: _____ **Home Plate:** _____ **Batter's Box:** _____ **Pitcher's Mound:** _____

Record the number of combined runs for both teams for each inning.
Use the table below to help calculate the total runs.

INNING	1	2	3	4	5	6	7	8	9	EXTRA INNINGS
D-BACK'S RUNS										
OPPONENT'S RUNS										
TOTAL RUNS										

Write the jersey numbers of the D-backs players from today's starting lineup from least to greatest:

1		4		7	
2		5		8	
3		6		9	



Positive Thoughts

Description: You will identify positive traits for yourself using the letters below.

Letter	Positive Traits
A	
T	
T	
I	
T	
U	
D	
E	



Breaking Barriers

Description: You will learn about different barriers you may face and how to overcome them by journaling.

START HERE

1 Choose our Topic

Brainstorm some ideas of barriers in your life. Choose one that you overcame, or are overcoming, by using one of Jackie Robinson's Nine Values.

2 Write Out Your Main Ideas

Brainstorm some ideas of barriers in your life. Choose one that you overcame, or are overcoming, by using one of Jackie Robinson's Nine Values.

3 Create Your Outline

Use an outline to help organize your main ideas. The outline will keep you on track as you write your essay.

4 Write Your Topic Sentences

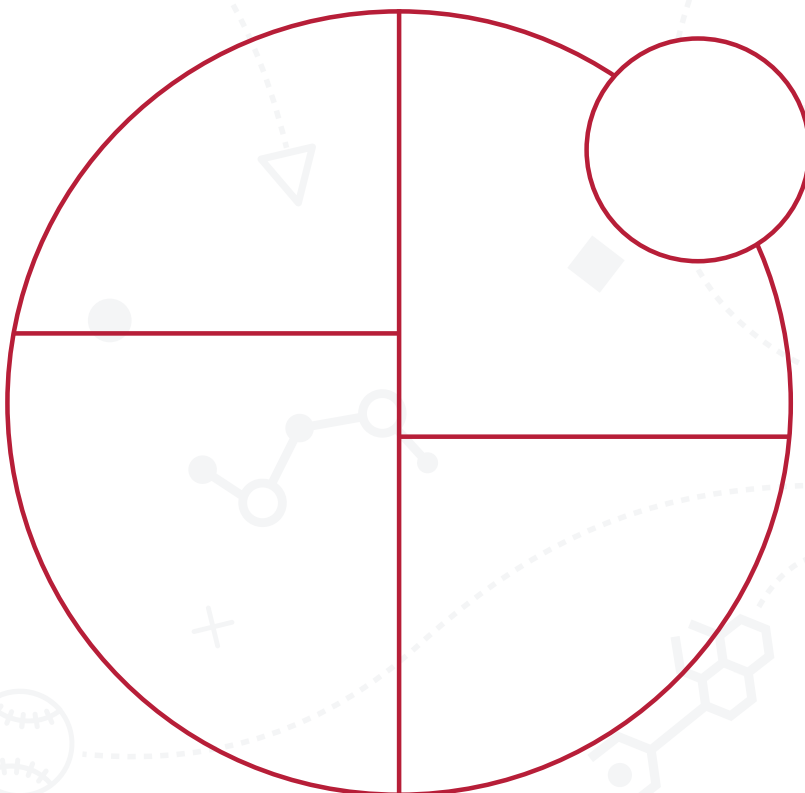
Use details from your outline to help you write topic sentences. Try writing practice sentences to get to the topic sentences you want. Now begin writing your essay!



MyPlate Nutrition Game

Description: You will roll a die 5 times for each food category and complete a fitness activity for the number you roll. Once completed, you will receive a food item to build a nutritious meal.

	Protein	Grain	Vegetable	Fruit	Dairy
1	A friend is upset by a mean social media post	10 Ski Jumpers	10 Calf Raises	10 Ski Jumpers	10 Arm Circles Front & Back
2	10 Invisible Jump Rope	You Forgot about a quiz and didn't study	10 Lunges	20 Jumping Jacks	10 Star Jumps
3	15 Jumping Jacks	10 Arm Circles Front & Back	You weren't selected for a part in the school play	10 Lunges	10 Calf Raises
4	10 Ski Jumpers	10 Invisible Jump Ropes	10 Squats	You lost a text book and haven't found it	10 Squats
5	10 Star jumps	10 Marching Knees and Arms	20 Invisible Jump Ropes	10 Arm Circles Front & Back	You weren't invited to an important event
6	5 Squat jumps	10 Shoulder Shrugs	10 Star Jumps	10 Invisible Jump Ropes	15 Mummy Jacks



Player Positions

Description: You will use the coordinate plane to complete the graphing activity and mark the different areas of the field.

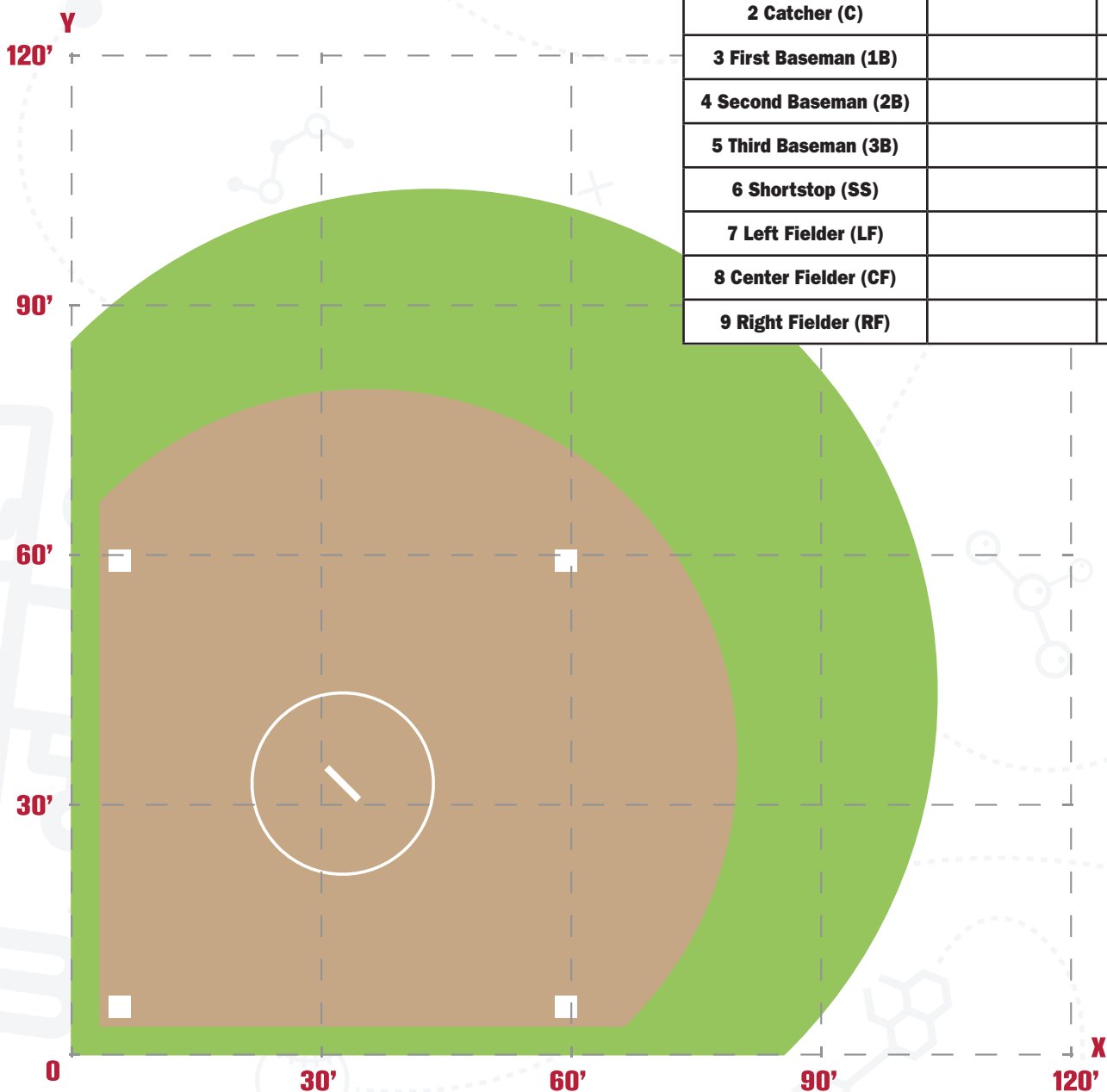
Activity: Write the name and mark the approximate location (x, y) coordinates of each of the ten-player positions (nine defensive positions and one offensive position) on the field.

1	P	Pitcher
2	C	Catcher
3	1B	First Baseman

4	2B	Second Baseman
5	3B	Third Baseman
6	SS	Shortstop

7	LF	Left Fielder
8	CF	Center Fielder
9	RF	Right Fielder

	X-Coordinate	Y-Coordinate
1 Pitcher (P)		
2 Catcher (C)		
3 First Baseman (1B)		
4 Second Baseman (2B)		
5 Third Baseman (3B)		
6 Shortstop (SS)		
7 Left Fielder (LF)		
8 Center Fielder (CF)		
9 Right Fielder (RF)		



How to Keep Score

SETTING THE LINEUPS AND POSITIONS

Write the last name of each player into the appropriate blanks on the scorecard as the batting orders are announced and shown on the scoreboard. Write the player's defensive position number in the next column, as shown in the example diagram.

KEEPING SCORE

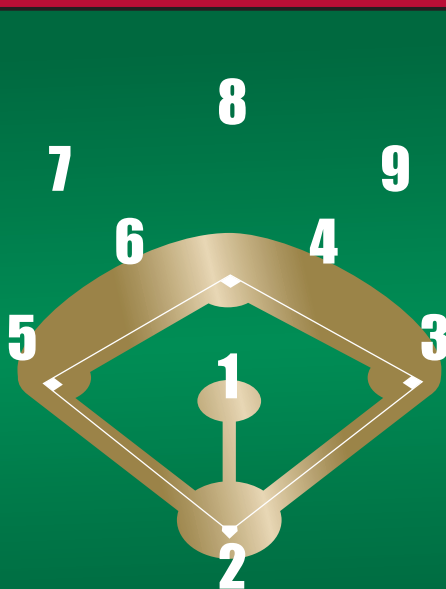
Every time a batter goes to the plate, use the numbers to indicate how he was retired or how he reached base. Fielding plays, retiring batters or runners also call for use of the numbers. For instance, the batter who grounds out to the shortstop can be written as 6-3 in the scorecard. If he flies to the right fielder, merely use the number 9. If it is foul, write F9. The lower left hand corner of the scoring box should be considered home plate. Progress is counter-clockwise with the progress to first base indicated in the right hand corner, to second in the upper corner, to third in the left corner, to home in the lowest corner. Show each batter's progress around the diamond by drawing a line from home plate to each base he reaches. Next to the base, write the abbreviation that shows how he advanced there. Indicate an out by writing the number of that out in the box and circling it.

SCORING EXAMPLE

First Inning: In the scorecard at the top, Mark Grace led off the inning with a single to center (1B8). Jay Bell struck out for the first out of the inning, but Mark Grace stole second base while Bell was up (SB8). Tony Womack grounded to the second baseman, who threw him out at first base (4-3) for the second out. Grace advanced to third on Womack's ground out. Matt Williams singled to left field (1B7), scoring Grace who had been on third. Luis Gonzalez singled to right field (1B9) and advanced to second base on a passed ball and Williams advanced to third. Steve Finley flew out to left (7) for the third out to end the inning.

Second Inning: Reggie Sanders reached first on an error by the second baseman (E-4). He was caught trying to steal second on a throw from the catcher to the shortstop (CS 2-6). Randy Johnson walked (BB). Damian Miller grounded the ball to the shortstop, forcing the out of Johnson, the lead runner, when the shortstop threw to the second baseman (6-4). The second baseman threw to the first baseman (6-4-3) to get Miller out on a double play (DP). Third out and side retired.

#	Player	Pos.	1	2
26	Miller	2	3 4	SB8 1B8
17	Trace	3	K ^①	
33	Bell	4	4-3 ^②	
5	Womack	6	5 1B7	2
9	Williams	5	PB9 1B9	
20	Gonzalez	7	7 ^③	
12	Finley	8		① CS 6 E-4
16	Sanders	9		② 6-4 DP BB
51	Johnson	1		③ 6-4-3 DP



ARIZONA DIAMONDBACKS ROSTER

Pitchers

Randy Johnson 51
Brian Anderson 34
Miguel Batista 43
Nick Bierbrodt 47
Troy Brohawn 54
Robert Ellis 55
Geraldo Guzman 50
Byung-Hyun Kim 49
Erik Knott 57
Mike Koplove 58
Albie Lopez 32
Erik Sabel 56
Mike Mohler 52
Bret Prinz 41

Catchers

Damian Miller 26
Rod Barajas 48
Ken Huckaby 45

Infielders

Jay Bell 33
Matt Williams 9
Tony Womack 5
Craig Counsell 4
Erubiel Durazo 44
Mark Grace 17

Outfielders

Steve Finley 12
Luis Gonzales 20
Reggie Sanders 16



Scorecard

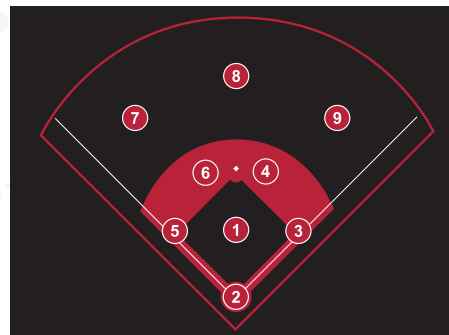
Description:

Learn how to keep score and follow along with one of the Arizona Diamondbacks games this year.

[illegible]

SYMBOLS FOR PLAYS

1B	Single	DP	Double Play
2B	Double	SH	Sacrifice Hit
3B	Triple	SF	Sacrifice Hit
HR	Home Run	SB	Stolen Base
E	Error	CS	Caught Stealing
BB	Walk	PO	Picked Off
IW	Intentional Walk	WP	Wild Pitch
HP	Hit by Pitch	PB	Passed Ball
K	Strike Out	BK	Balk
L	Line Out	PH	Pinch Hitter
FC	Fielder's Choice	PR	Pinch Runner
F	Foul Out		



Stretching and Injury Prevention

Activity: Injury prevention is crucial to all levels of athletes to keep them performing at their best. Getting ahead of injuries and taking steps to prevent them helps athletes stay healthy and avoid season or career ending injuries. You will complete a full body scan of any aches, pains, bruises, or bumps that you may have and your partner will note them down on the diagram.

.....

Answer the following questions about how to help prevent injuries:

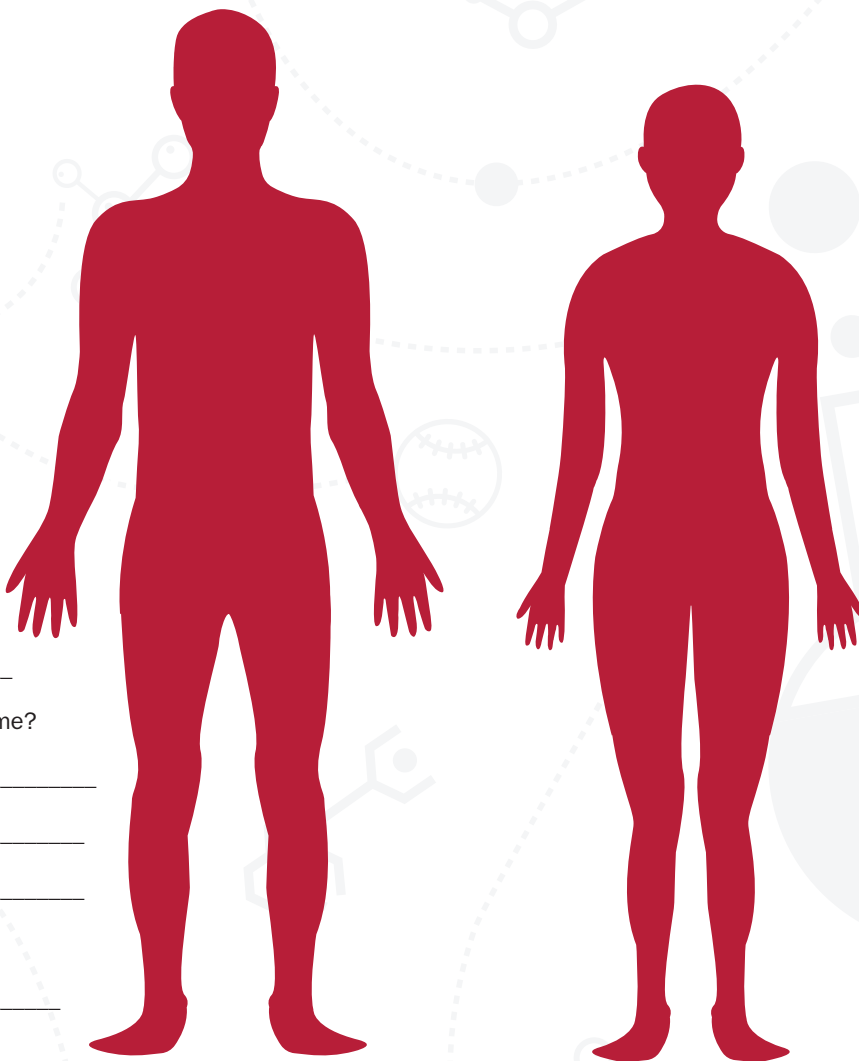
How can getting a good nights sleep help athletes prevent injury?

Why do athletes “warm up” before practice or a game?

What foods can help you prevent injury?

How does stretching help in recovery from exercise?

How can working out your mental fitness help keep you from getting injured?



Forward Bend



Hip Flexor Stretch



Abs Stretch



Quad Stretch

Carbon Footprint

Description: In this activity you will learn about living sustainably, how to sort waste, and how to build a better, greener world. Everyone has their own carbon footprint, which means the amount of greenhouse gases that are released in the air. Examples include activities such as, heating your house, transportation, and how much trash you throw away.

Carbon Footprint: The amount of greenhouse gas emissions caused by a person or group.

Carbon Neutral: Making no net release of carbon dioxide into the atmosphere, especially through offsetting emissions (example planting trees).

Life Cycle Assessment: A tool used to determine carbon footprint based on all the effects of an activity.

Step 1: Research online different ways that Chase Field practices environmental sustainability.

Step 2: Track your environmental consumption over one week and identify ways to improve your carbon footprint.

Write in ways to improve the following (on the baseball cleat footprint below):

Electricity:

Water:

Waste:

Transportation:



Strike Zone

Description:

Learn how to measure and calculate the area of your strike zone.

Activity:

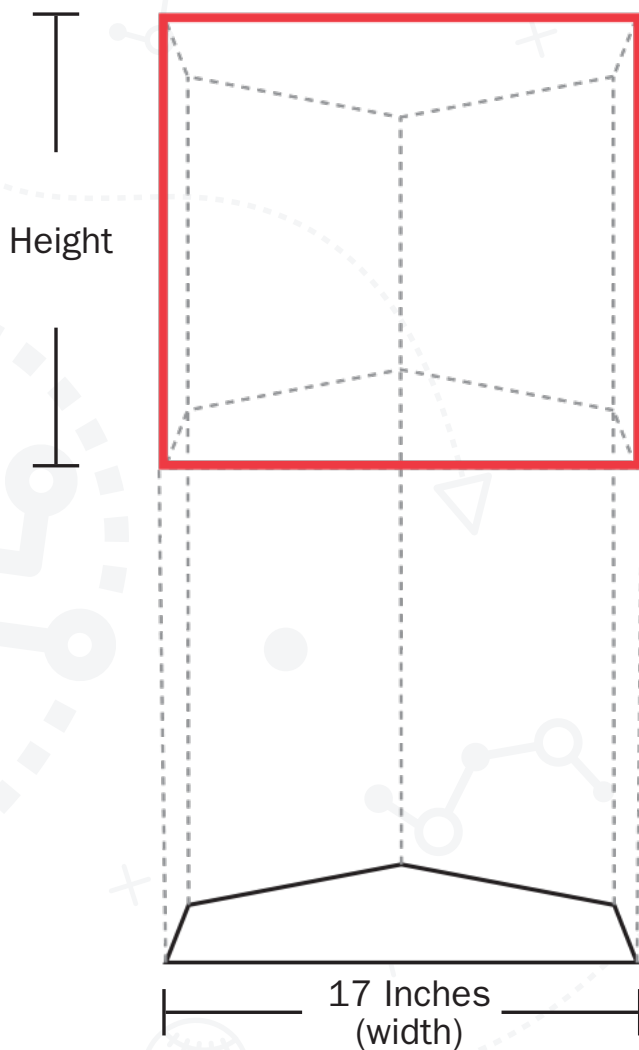
Measure the length of your strike zone. Measure the width. Determine the shape. Calculate the perimeter. Calculate the area.

Key Concept:

$\text{Area of a rectangle} = \text{height} \times \text{width}$

Hint:

The **width** of the strike zone remains constant as it is the width of home plate: 17 inches. The **height** is the measurement from the batter's knees to roughly their uniform letters. A **strike zone** is the area of space above home plate that a pitch must pass through in order to be called a strike.



Statistics

Description:

Analyze baseball cards and learn about the statistical analysis of player stats. Once you are finished with that, roll dice and calculate how many times you roll a 1 or 2 out of 10 times. Convert that fraction to a decimal and a percentage.

Activity: Roll a die to see what your batting average could be out of 10 tries.

Key Concept: $\text{batting average} = \frac{\text{hits}}{\text{at bats}}$



Using Luis Gonzalez's hitting stats, answer the following questions:

Roll #	Hit	Out
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

LUIS GONZALEZ OF													20
Luis is one of the most popular figures in D-backs history because of the way he interacted with fans and his game-winning single in game 7 of the 2001 World Series to give the organization its first world championship.													
D-BACKS CAREER	G	AB	R	H	2B	3B	HR	RBI	SB	BB	SO	SLG	AVG
99 D-BACKS	153	614	112	206	45	4	26	111	9	66	63	.549	.336
00 D-BACKS	162	618	106	192	47	2	31	114	2	78	85	.544	.311
01 D-BACKS	162	609	128	198	36	7	57	142	1	100	83	.688	.325
02 D-BACKS	148	524	90	151	19	3	28	103	9	97	76	.496	.288
03 D-BACKS	156	579	92	176	46	4	26	104	5	94	67	.532	.304
04 D-BACKS	105	379	69	98	28	5	17	48	2	68	58	.493	.259
05 D-BACKS	155	579	90	157	37	0	24	79	4	78	90	.459	.271
06 D-BACKS	153	586	93	159	52	2	15	73	0	69	58	.444	.271
D-BACKS TOTALS	1194	4488	780	1337	310	27	224	774	32	650	580	.529	.298

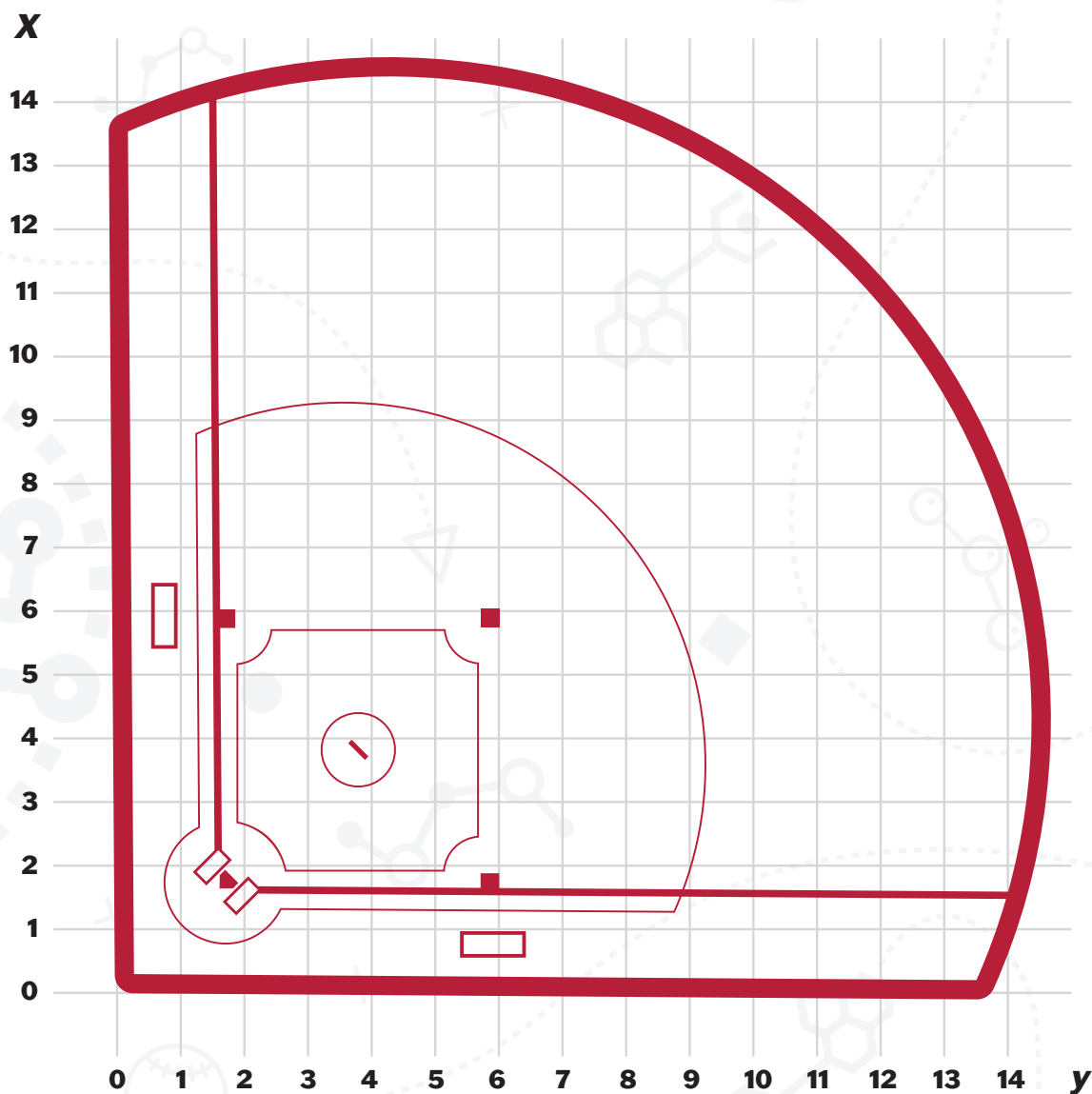
1. In what year was his highest batting average?
2. In what year did Luis Gonzalez have the lowest batting average?
3. What is the highest number of hits Luis Gonzalez had in a single season?
4. What is the average number of home runs Luis Gonzalez hit over the 8 years?



Field Geometry

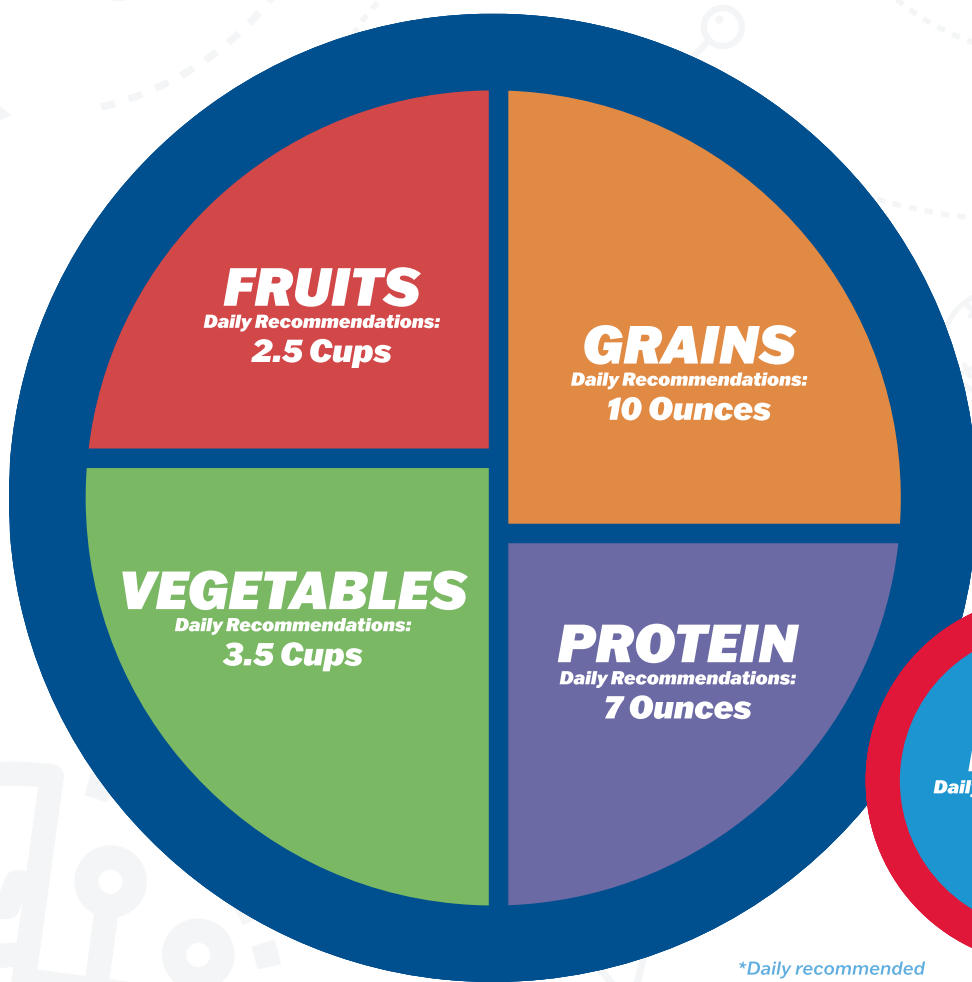
Activity: Draw the geometric shapes that belong on the field using the hints provided. You can decide on the distances between home plate and the outfield walls. The hints give you additional information that must be followed.

Field Geometry Hints				
90 feet between each base	60 feet 6 inches to the pitchers mounds	The bases are squares	Homeplate is a pentagon	The pitchers mound is a circle
The batters box is a rectangle	The left field and right field foul line meet to form a right angle	The on deck area is a circle	The infield/outfield grass line is 95ft radius from the front of pitchers rubber	Customize your own outfield wall dimensions



Nutrition

Activity: Proper nutrition for workouts, practice, and games require planning. A diet with adequate carbohydrates, protein, and fat is needed to fuel a soccer player and support athletic performance. Plan a day of fueling and hydrating your body for soccer game day.



Before the Game:

- Breakfast
- Pre-Game Snack

During the Game:

- Fluid
- Snack

After the Game:

- Nutrient-rich Beverage
- Replenishing Snack

**Daily recommended intake for 9-13 year olds*

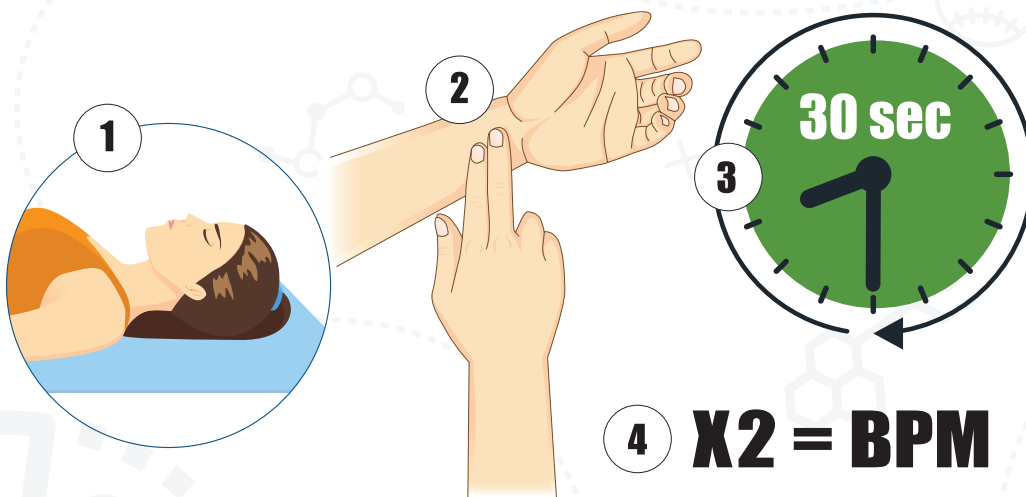
Before the Game:	During the Game:	After the Game:



Heart Rate

Activity: Use the directions below to analyze the heart rate of both you and a classmate at rest, after jumping jacks, after sit-ups, and after running around the bases. Conduct each activity for 30 seconds.

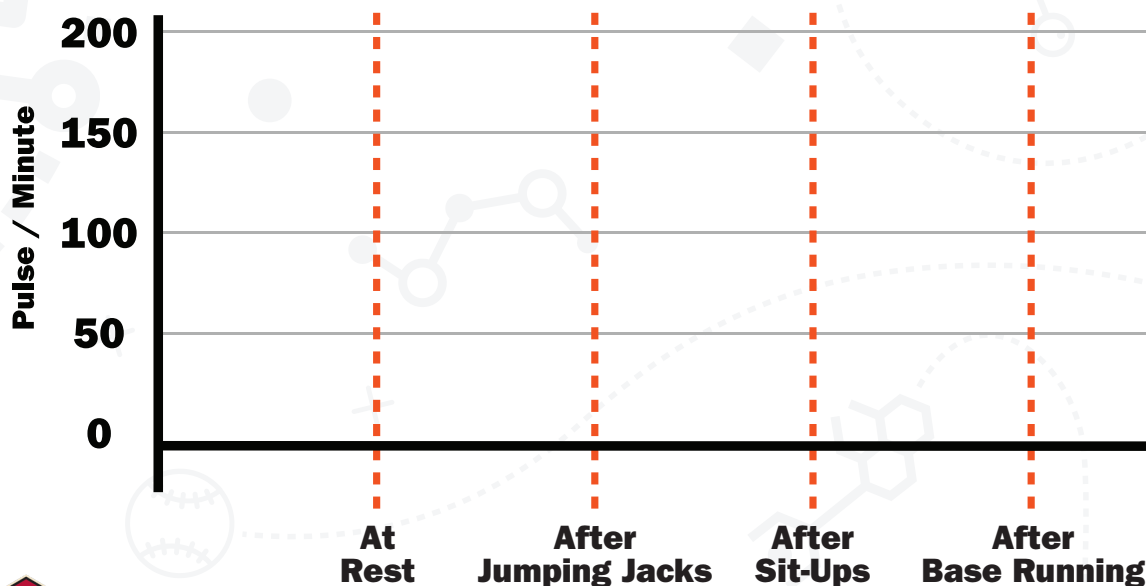
	At Rest (BPM)	Jumping Jacks (BPM)	Sit-Ups (BPM)	Base Running (BPM)
My Heart Rate				
Classmate's Heart Rate				



1. Rest quietly
2. Gently place 2 fingers on the inside of your wrist
3. Count the beats for 30 seconds
4. Double this number to get the number of beats per minute (BPM)

Plot the results of you and your classmate using the graph below:

HEART RATE CALCULATION



Batter Reaction Time

Description: How much time do batters have to react to different pitch speeds?

Activity: Calculate the time it takes for a baseball or softball traveling “x” mph to reach home plate. The distance between the pitcher’s mound and home plate in baseball is 60 feet 6 inches and in softball it’s 43 feet.

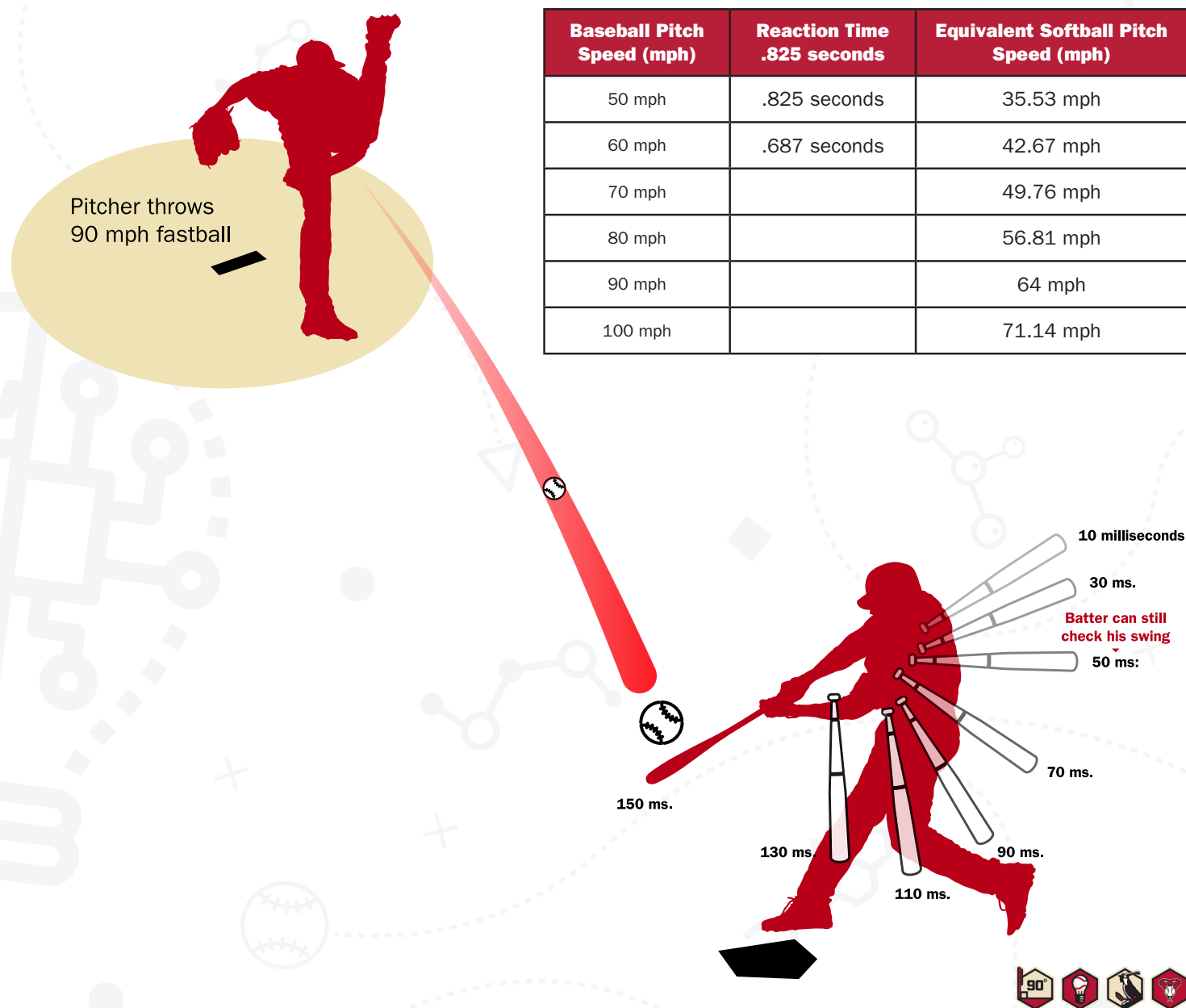
The Math:

Speed = Distance ÷ Time

Hint: To find reaction time (in seconds), we need to convert miles per hour into foot per second. We can do that by multiplying the pitching speed (in miles per hour) by 1.467. For example, using that conversion, the reaction time for a 10 mph pitch on a baseball field would be 4.124 seconds.

Baseball Example: $60.5' \div (10 \text{ mph} \times 1.467) = 4.124 \text{ seconds}$.

Softball Example: $43' \div (10 \text{ mph} \times 1.467) = 2.931 \text{ seconds}$



Sleep for Peak Performance

Description: There are five stages of sleep that you experience while sleeping. Match the correct description with each stage of sleep.

STAGE 1

STAGE 5

STAGE 2

STAGE 4

STAGE 3



Match the descriptions below with the stages above.

Very deep sleep
Muscle activity
is limited

REM sleep
Brain waves speed up and
dreams occur
Hear. Heart rate increases

Deep sleep starts
Brain starts to generate
slow delta waves

Very light sleep
Muscle activity
slows down.

Breathing pattern and heart
rate slows down body
temperature decreases slightly

YOUR SLEEP HYGIENE CAN IMPROVE THE QUALITY OF LIFE

1 Create a schedule

2 Don't force yourself asleep

3 Avoid Caffeine

4 Avoid napping sleep

5 Use bed for sleeping

6 Exercise and eat well

7 Sleep in a comfortable environment



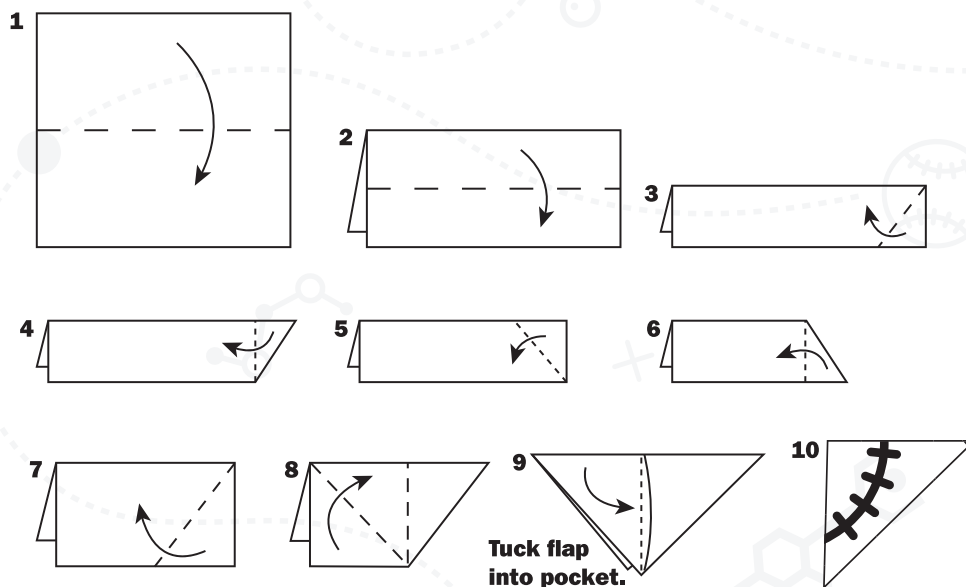
Launch Angle

Description: When a baseball is hit, the resulting motion is determined by Newton's Laws of Motion. You will learn about different launch angles and trajectories of a baseball as it travels through the air.

Materials: Pencil, Piece of Paper, & Tape Measure

Activity: Build Your Own Paper Flickr

Step 1: Follow the instructions for folding the paper into a flickr:



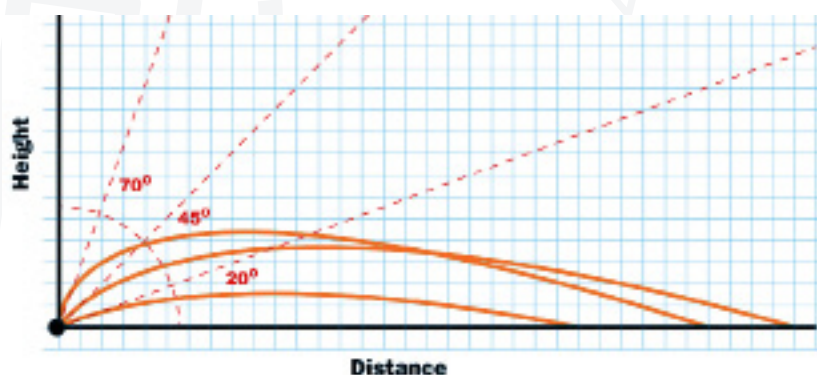
Ground Ball
Less than 10°
Line Drive
10° – 25°
Flyball
25° – 50°
Pop Up
Greater than 50°

Step 2: Design Your Paper Flickr

Design and color your paper flickr anyway that you like!

Step 3: Flick Away! Try flicking the paper flickr at different angles.

Step 4: Try launching the paper flickr at the different angles using the table below. Use your tape measure to measure how far each paper flickr will go and record the results.



Launch Angle (degrees)	First attempt distance (feet)	Second attempt distance (feet)	Third attempt distance (feet)	Average distance (feet)
70				
45				
20				



Elasticity

Description: Explore the physical properties of materials and their interactions to external forces. Using a tape measure, experiment with different balls and conditions to determine their elasticity.

Key Concept - Elasticity: the tendency of solid materials to return to their original shape after being deformed.

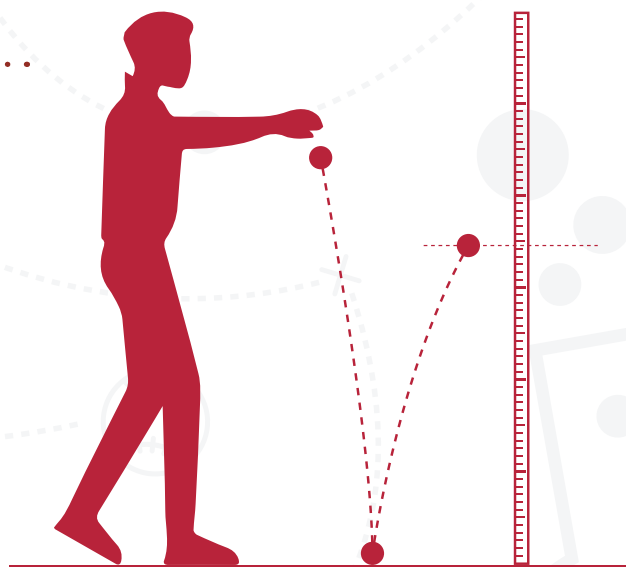
Materials: Baseball, tape measure, pencil, & other sports balls (tennis ball, golf ball, soccer ball, etc)

- Drop the baseball & other objects from a height of 5 feet (62 inches). Measure the height of the first bounce (in inches) and repeat for the other two trials. Use a hard surface and other surface to complete this activity.
- Calculate the average bounce height (in inches) for both the hard surface and other surface.

Hint: Average formula = total sum of all the numbers / number of items

Gravity is the force that pulls down on an object. Gravity affects the motion of a ball when it's being dropped or kicked.

What are some ways that elasticity is observed to the baseball?



Hard Surface	Trial 1 Bounce Height (inches)	Trial 2 Bounce Height (inches)	Trial 3 Bounce Height (inches)	Average Bounce Height (inches)
Baseball				
Beach Ball				
Golf Ball				
Foam Ball				

Other Surface	Trial 1 Bounce Height (inches)	Trial 2 Bounce Height (inches)	Trial 3 Bounce Height (inches)	Average Bounce Height (inches)
Baseball				
Beach Ball				
Golf Ball				
Foam Ball				

What is the action of the ball?

What is the reaction of the ball?



Aerodynamics

Description:

Learn about the aerodynamic properties of a ball in flight and the influence of spin on its trajectory.

Key Concept:

Magnus effect: when a spinning ball curves away from its principal flight path.

Activity: Match the pitch type with the ball movement for that pitch.



FASTBALL



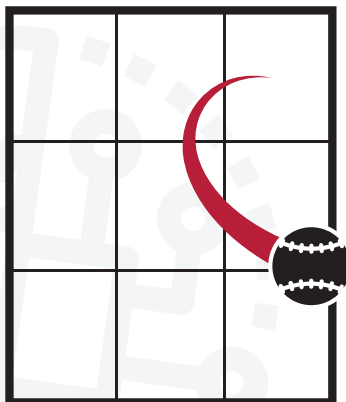
CURVEBALL



KNUCKLEBALL



SLIDER

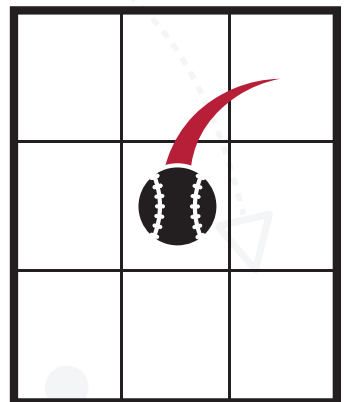


Batter view

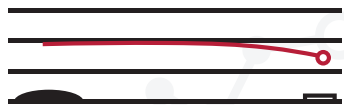


View from the side of the plate

Pitch type:

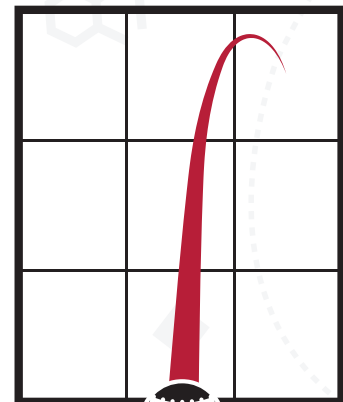


Batter view



View from the side of the plate

Pitch type:

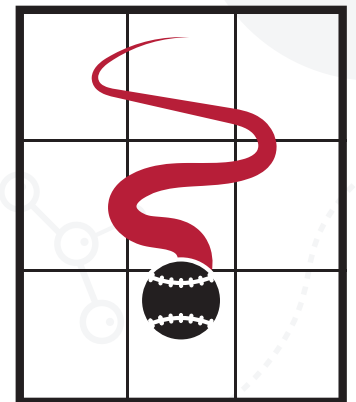


Batter view

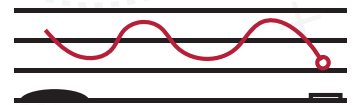


View from the side of the plate

Pitch type:



Batter view



View from the side of the plate

Pitch type:

Playing Surfaces

Description: Baseball is played on two different types of surfaces. A grass field or an artificial turf field. Each MLB team uses their own types of grass or artificial turf. In this lesson, you will explore the different types of grass and turf.

Activity: Explore the different types of grass and artificial turf to determine what you think is the best surface to play baseball.

- Below are the different types of grass and artificial turf. What are the differences between turf and grass? Discuss with a family member or friend.

Hint: Research online to find out the differences between these types of grass and turf.

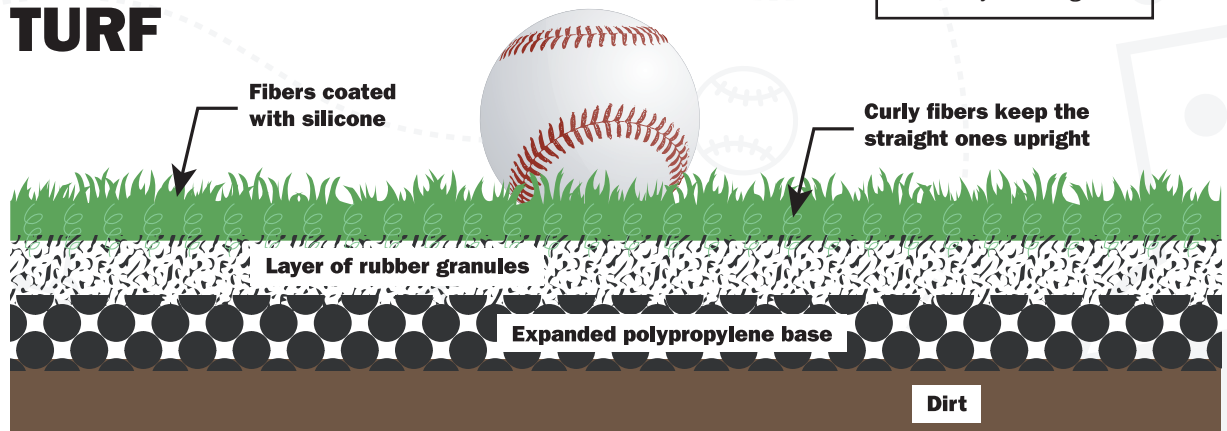
Fun Fact:

Chase Field has Shaw "B1K" synthetic grass.

Turf

- Astro Turf
- Field Turf
- Natural Grass Turf

TURF



Grass

- Kentucky Bluegrass
- Perennial Ryegrass
- Bermuda Grass

GRASS



- Think about playing baseball on a grass field or on artificial turf. Which surface do you think is better to play on and why? Discuss with a family member or friend. Next time you play baseball, think about if you are playing on turf or grass and see if you can see the differences.

What is the most popular type of playing surface found in Major League Baseball?

What are some key factors in what type of grass a MLB team uses?



Game Day Revenue

Description:

Calculate the expected revenue from ticket sales and the analyze stadium capacity.

Key Concepts:

Game revenue = (number of tickets sold x price of the ticket) + (merchandise x number of people purchasing merchandise) + (food x number of people purchasing food) + (parking x number of cars parked)

Assuming Chase Field is sold out, what is the potential revenue that can be generated in one game?

- Capacity of Chase Field is approximately 48,633 when the game is sold out
- Average price of a ticket is \$20
- Average merchandise purchase per person is \$5
- Average food consumption per person is \$10
- Parking is \$10 per car, assume 2 people per car

Expense	Quantity	Cost
# of fans attending game =		
Average price per ticket =		
Average merchandise per person =		
Average food expense per person =		
# of cars =		
Parking per car =		

Total potential revenue for one game is:

Calculate the game day revenue for 2 home games from the Diamondbacks' 2022 Season.

Opponent:	Quantity	Cost
Average price per ticket \$20		
Average merchandise per person \$5		
Average food expense per person \$10		
		Game Total:

Opponent:	Quantity	Cost
Average price per ticket \$20		
Average merchandise per person \$5		
Average food expense per person \$10		
		Game Total:



Ballpark Design

Description: Compare Chase Field to other ballparks in the National League West.

Activity: Write in below unique features from each NL West stadium.

Coors Field
(Denver, CO)

Dodger Stadium
(Los Angeles, CA)

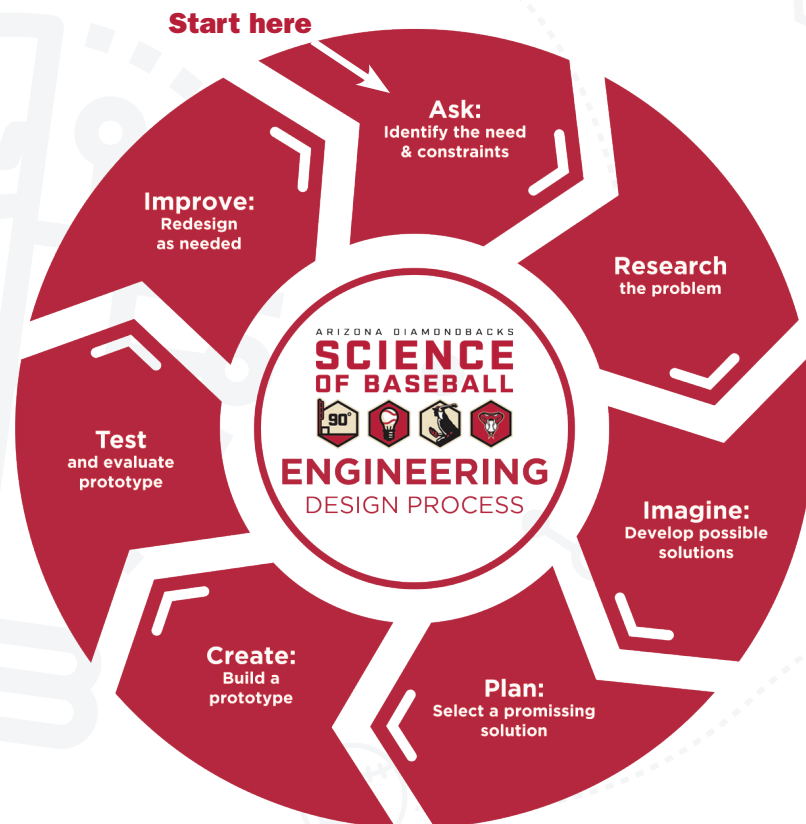
Oracle Park
(San Francisco, CA)

PETCO Park
(San Diego, CA)

**QR Code for
NL West stadiums**



How do these features compare to Chase Field?



Stadium Design Ideas



Stadium Capacity



Stadium Features



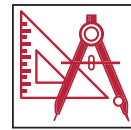
Number of Parking Spots



Merchandise



Food



Unique Features

What are your stadium design ideas?



Build Your Team

Description:

Research and design your own team roster. You can select five Pitchers, one Catcher, one First Baseman, one Second Baseman, one Third Baseman, one Shortstop, and three Outfielders. Look up each player's salary and identify their salaries during the 2021 season. The sum of the player salaries for one season may not exceed \$100 million.

QR Code for player salaries

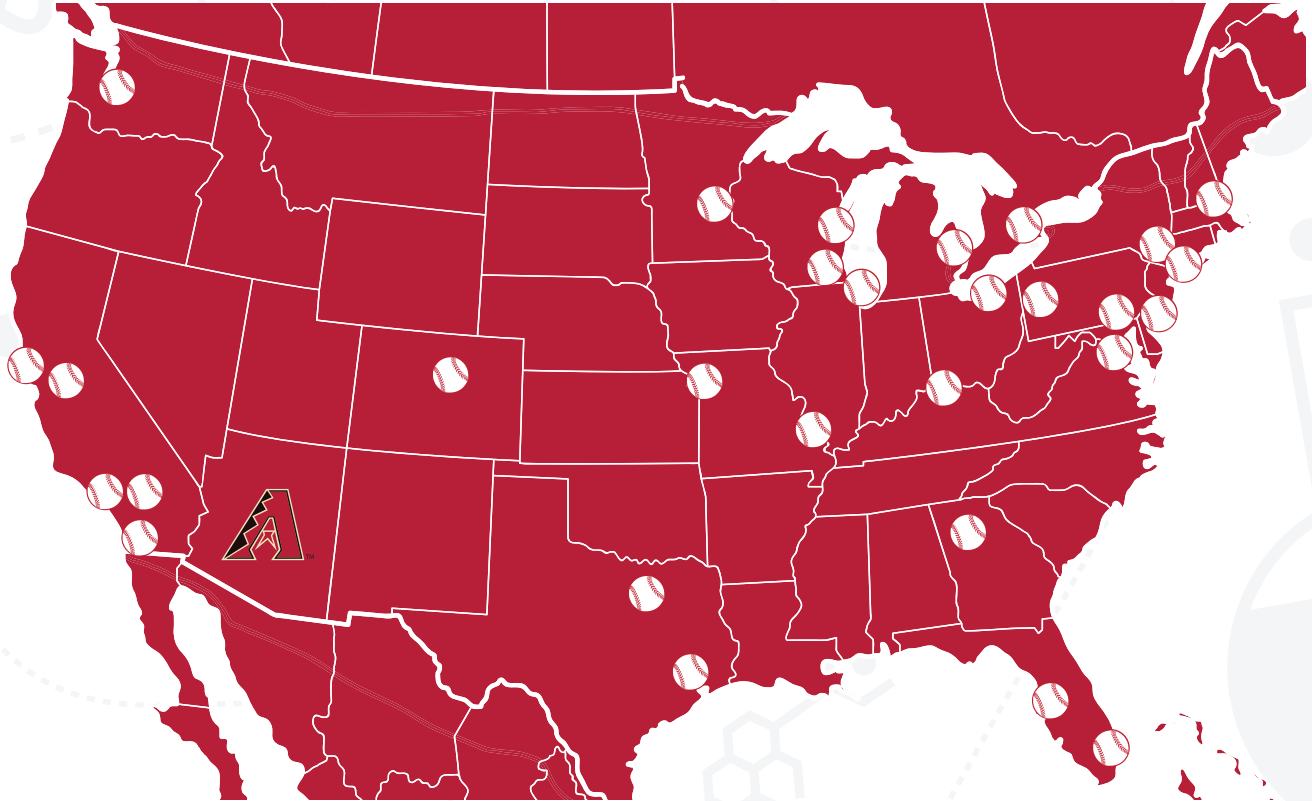


Team Name:		
Player	Position	Salary
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
Total:		



Road Trips

Activity: Identify the 30 MLB teams and their locations. Plan and calculate the cost of a road trip to see 3 MLB games.



Plan a road trip to visit three MLB stadiums. Develop a budget for the road trip that includes:

4 tickets to the game

Fuel for the trip

Example:

Phoenix, AZ to Arlington, TX 1,020 miles

Arlington, TX to Miami, FL 1,334 miles

Miami, FL to Washington, D.C. 1,051 miles

Washington, D.C. to Phoenix, AZ 2,301 miles

Total miles traveled: 5,706 miles

	Start	End	Miles Driven	Cost of Gas	Cost of Tickets	Total Cost of Trip
Trip 1						
Trip 2						
Trip 3						
Return Trip						

Total # of Miles Driven	Total Cost of Gas	Total Cost of Tickets	Cost of Entire Road Trip



MLB Teams link:
mlb.com/team



Ticket Prices link:
mlb.com/tickets



Gas Prices link:
gasprices.aaa.com/



Hydration

Description: Hydration is the process of replacing water that has been used throughout the body. You will learn the importance of staying hydrated (Drinking water) during physical activities.

Activity: Complete the worksheet discussing the importance of staying hydrated.

- Learn about how many ounces of water are in a cup by reading the key concept.
- Calculate how many ounces of water you should drink each day. (For example: if you weigh 90 pounds, $90/2 = 45$ ounces of water). Use the hydration log to mark off how many ounces of water you drink and answer the questions below.

Key concept: 8 ounces = 1 Cup, 64 ounces = 8 Cups = 1/2 Gallon

Hydration log (each drop = 1 cup)



Young Athlete

Weight 80 pounds
Recommended water
intake: 8-10 cups of water per day

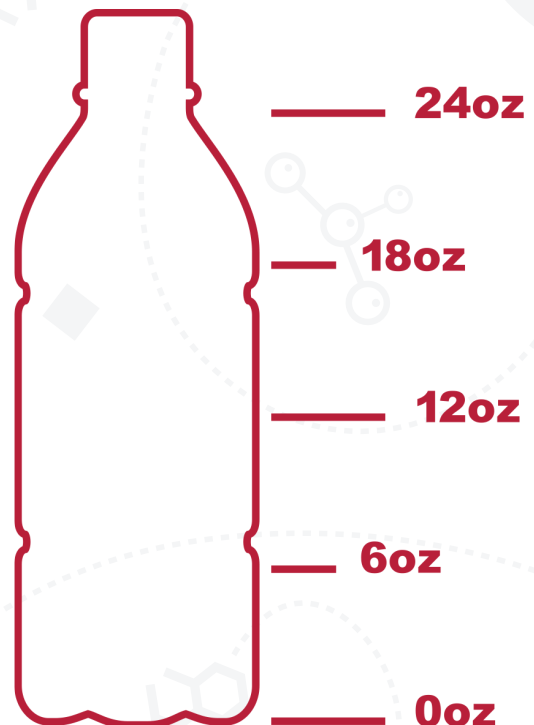


Average MLB Player

Weight 205 pounds
Recommended water
intake: 16-20 cups of water per day



1. Why is water important?
2. How do you know you're getting enough water?
3. Signs of dehydration:
4. Tips for staying hydrated:
5. Why is it important to drink water before, during, and after playing baseball?
6. What units of measurement can be used to measure the amount (volume) of water?
7. If a baseball player has a 24-ounce bottled water, how many ounces should she drink if she wants to drink $\frac{1}{2}$ of it?



STEM Jobs at Chase Field

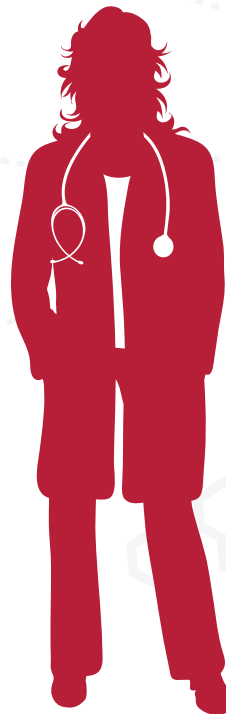
Description: Science, Technology, Engineering, and Mathematics (STEM) are important skills in many different jobs, especially in sports. There are many jobs at Chase Field where STEM skills are used during the season and after the season is finished.

Activity: Try to match the job title on the left with the job description on the right.



GROUNDKEEPER

DOCTOR



This person uses their knowledge about physics, buildings, and structures to oversee the construction of Chase Field and the improvement of the facilities.

This person uses their knowledge of math and computers to calculate player and team performance and make recommendations for the coaches.



ENGINEER

STATISTICIAN



This person uses their knowledge about science, medicine, and the human body to ensure baseball players remain healthy throughout the season.

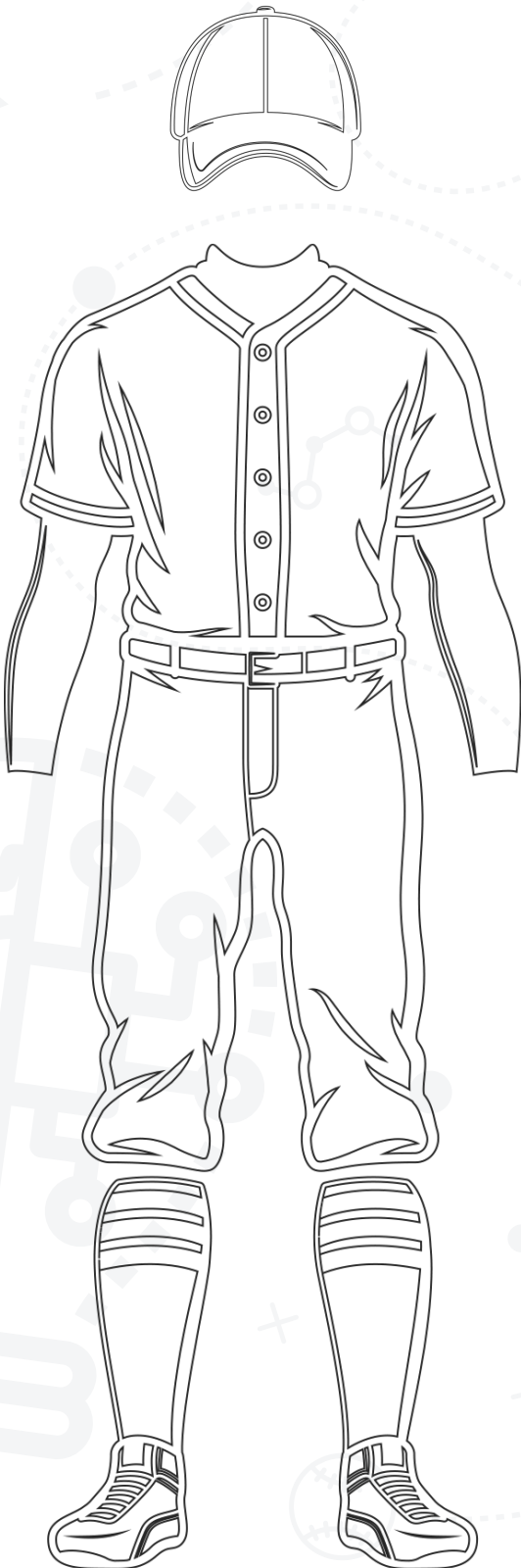
This person uses their knowledge about science, grass, dirt, water, and light to ensure the baseball field is in excellent condition before and during the game.



Uniform Design

Description:

Create Your Team – Logo, Uniform, and Mascot. Consider the size, color, and symmetry when creating your logo.



Design your logo:



Design your mascot:



Arizona Diamondback logos



Arizona Diamondbacks color palette



Mascot: Baxter the Bobcat





CHAMPIONS WORLD CHAMPIONS

CARD

Banner Health

GEICO

CHASE FIELD

HOME OF THE DIAMONDBACKS



CHASE FIELD

HOME OF THE DIAMONDBACKS

C vs A

FIRST PITCH - 12:40PM

AARON CIVALE

1-2 H 6.14 ERA

TAYLOR WIDENER

1-0 H 4.00 ERA

Dbacks Give Back

Coors Field
STRIKE ZONE