

Guardians™

**STEM
FAIR**

PRESENTED BY *Swagelok*



POWERED BY [NEO:STEM]



GUARDIANS YOUTH SUMMER CAMPS



Presented by
**UNIONHOME
MORTGAGE**

**MAJOR LEAGUE
INSTRUCTION FOR
KIDS 6-14**


CLEGUARDIANS.COM/CAMPS



Guardians

FAMILY VALUE PACK

4 TICKETS + \$40 LOADED VALUE FOR JUST \$80

Benefiting:  Cleveland Clinic Children's

WELCOME TO THE CLEVELAND GUARDIANS STEM FAIR PRESENTED BY SWAGELOK!

We are excited to learn about **STEM** (Science, Technology, Engineering, and Math) with you today! Visit our Cleveland community around the Progressive Field to participate in as many hands-on activities as you can. Then keep looking for STEM as the Guardians play against the Tigers today! Our fair is powered by support from the Cleveland community, Swagelok and NEO STEM. A special thank you to the professional and volunteers who are helping educate the next generation of STEM!

THANK YOU TO THE CLEVELAND COMMUNITY AND EXHIBITORS!

Alliance for Working Together
Foundation
American Heart Association
Bendix Commercial Vehicle Systems
LLC
Burns & McDonnell
CGI
Cleveland Builds
Cleveland Cliffs
Cleveland Clinic
Cleveland Clinic LRI
Cleveland Museum of Natural History
Cleveland Public Power
Cleveland Technical Societies Council
Cleveland Water
CommuteAir
Deetronics
Education Projects
Girl Scouts of North East Ohio
Great Lakes Adventures
Greater Cleveland Aquarium
Holden Forests & Gardens
Hyland
IEEE-CLE

John Carroll University
Lake Erie Council, Boy Scouts
of America
Legends Athletics
Lincoln Electric
Lorain County Community College
Lubrizol
LYF Foundation Corp.
Minority Tech Alliance
NASA's Glenn Research Center
NEORSD
NeoSTEM
Oatey
OEM/Miller Division of Ilpea Industries
Ohio Space Grant Consortium
Parker Hannifin Corporation
Polaris Career Center
Slabe Machine Products
Swagelok
The Sherwin-Williams Company
Tiffin University
Water Pollution Control
Worthington Steel/TWB
Young Entrepreneur Institute

TIMELINE

10:00 AM – 1:30 PM | Cleveland Guardians STEM Fair

Located on the outer Main Concourse and Family Deck

12:00 PM | Gates and Ballpark opens to all fans

Concession stands available for lunch

1:10 PM | First Pitch! Go Guardians!

Download the **BALLPARK APP** for quick tips to help your visit! Find a detailed map of Progressive Field, menus of the concession stands, mobile ordering, security help and support!

LOST OR HAVE QUESTIONS?

If you got separated from your group, don't panic! We are here to help. Go to the nearest gate or find a game day staff member, and they can radio security!

The Fan Service Support Centers are located near section 153 and 550 or call: 216-420-4487

BUS PICK UP

Bus pick up is located on Ontario Street in the taxi lanes near Progressive Field and Rocket Mortgage Field House.

CASHLESS BALLPARK

All purchases inside the ballpark must be made with a credit or debit card, Apple Pay, Google Pay or Guards Mobile Wallet. Additionally, and at no charge, fans will be able to convert cash to a prepaid card via reverse ATM machines that can be used for purchases inside and outside the ballpark. These will be located near Lower and Upper Level Fan Services (behind sections 153 and 550), the left field gate and right field neighborhood area.



1. Swagelok
2. NEOSstem
3. Young Entrepreneur Institute
4. Tiffin University
5. Holden Forest and Gardens
6. Cleveland Aquarium
7. Cleveland Builds
8. Great Lakes Adventure
9. Lake Erie Council
10. Commute Air
11. NEORS D
12. Lubrizol
13. Ohio Space Grant Consortium
14. Girl Scouts
15. Sherwin Williams
16. Natural History Museum

17. American Heart Association
18. OEM Miller
19. Education Projects
20. Cleveland Power
21. Deetronics
22. Alliance of Working Together
23. John Carroll
24. Hyland
25. Lincoln Electric
26. NASA
27. LCCC Magic of Science
28. CGI
29. Burns and McDonnell
30. IEEE-CLE
31. Swagelok
32. Water Pollution Control

33. Legends
34. Bendix
35. Cleveland Water
36. Oatey
- 37-40. Cleveland Clinic
41. Worthington Steel
42. Mortenson
43. Cleveland Technical Society
44. LYE Foundation
45. Slabe Machine Products
46. Polaris Career Center
47. Minority Tech Alliance
48. Parker Hannifin
49. Cleveland-Cliffs

NeoSTEM is thrilled to welcome all the students and educators to this incredible partnership event with the Cleveland Guardians!

NeoSTEM is a collaborative STEM Learning Ecosystem that unites area stakeholders in education, business and industry, utilities, non-profits, philanthropy and grassroots organizations to improve access to high-quality STEM learning for all students.. Together, we create exciting opportunities for students to explore science, technology, engineering and math, along with critical thinking skills, inspiring the next generation of innovators and problem-solvers who will shape the future of our community.

A big welcome to all our STEM Ecosystem leaders and partners here today! We're so excited to collaborate with you and create even more amazing experiences for our students. Together, we can open doors, spark curiosity, and empower young people to pursue their passions in STEM.

Let's celebrate today's bright future as we continue to work together to build a thriving STEM community in Northeast Ohio!



Explore Pressure and Torque with Swagelok

Swagelok

Like the Guardians, Swagelok is proud to call Northeast Ohio home. For more than 75 years, we've been developing fluid system products and solutions for some of the most demanding, high-stakes global industries. Swagelok is consistently recognized as a top workplace and we strongly support manufacturing and STEM careers through educational partnerships, community outreach, and workforce development. Plus, we're a key supporter of the Guardians' STEM Day.

Balloon Blast Adventure:

Experience the excitement of a balloon-bursting competition! Students use bike pumps, Swagelok piping, and fittings to explore pressure dynamics and engineering principles. This engaging hands-on activity not only adds a competitive edge but also provides valuable insights into real-world STEM applications.



Mission Twisted-Torque:

In this hands-on STEM activity, students will blend physics, technology, and fun. Students use unique objects and technical gadgets to explore the fascinating world of torque, testing their strength and understanding how forces make things happen.

Torque: The measure of force that causes an object to rotate around an axis.



Swagelok & STEM Word Search



Search for the words related to Swagelok & STEM
using the list at the bottom of the page.

C I L Y S J M O Q D G U H Q U A L I T Y
U N G S I I A W P M R H U T E G P K G K
Y D F D H E M S B A P U I S S O S V Q C
E E P P F C E L F N S X S N U N G A Q U
Z X X O G U Y W N U I K S O O P N L R S
T P D E L E G H R F B X S I U A I V Y T
T E F A P U O M I A X Z N T N V T E N O
M R V D Y L L I E C P V G U I A T S R M
I T I D T Y O A F T O G X L T U I G N E
M I L C I G N H B U S Y J O N I F M N R
A S W E R R H E K R Z Y H S O A A N O F
S E C D G U C R U I E B S T C T H L I O
Q T P J E L E E B N N C O D H Y D O T C
Q Z E O T L T S R G Z O N M I D U X A U
D O L M N A O P M Y F E A E U U C P V S
Z A I D I T R E S A L T P A I U L E O Z
C D F M I E Q C I V I M U T S C N F N R
V K Z P L M U T K C C I Y O U A S H N N
B W K B Z R E M S Q C H K E V P E R I W
W H L K J I R V S E N G I N E E R I N G

engineering
manufacturing
values
mathematics
improvement

fluid system
technology
fittings
respect
valves

innovation
solutions
stem
customer focus
integrity

expertise
quality
science
metallurgy
torque

WHAT IS STEM?

STEM stands for Science, Technology, Engineering, and Math. It's a way of learning about the world through exploring, asking questions, and solving problems using these foundational tools.

SCIENCE

Ever wonder what H₂O means in science? Or how to describe today's weather using scientific vocabulary like "cumulus clouds," "zero precipitation," and "humid"? You're already off to a great start!

TECHNOLOGY

Did you use any technology today? Hmm, would a pen or pencil count? Let's see how tech-savvy you are!

ENGINEERING

Are you curious about how things are made and how they work? Do you like to solve problems and come up with new ideas? Engineering lets you use creativity and knowledge to build things that make the world better!

MATH

How did you get to this event today? Can you guess how long it will take you to walk back from the stadium? Think you can make it? Time to put your math skills to the test!

HOW YOU CAN USE STEM EVERY DAY?

1. Ask a ton of questions! Use your curious mind to wonder about the world around you and dream up new ideas. It's totally cool to ask "how," "what," and "why" and never stop seeking answers.
2. Next, team up with other STEM geniuses like your friends, teachers, and family to create experiments and test out theories. Don't be afraid to try new things and keep practicing until you get it just right - that's what STEM experts do!
3. And last but not least, always keep in mind, what STEM job can help me solve a problem? Whether it's a cool gadget designer, a sustainability expert, or a math whiz, there are tons of careers out there that focus on using STEM to make the world a better place.

Stay curious and stay creative! These are just a few examples of how you can flex your STEM muscles and become a true STEM All-Star! Let's explore more and have some fun with it!

PITCH SCIENCE

Pitching is one of the most important aspects of baseball. A great pitcher can strike out batters, keep the other team from scoring, and even help lead their team to victory.

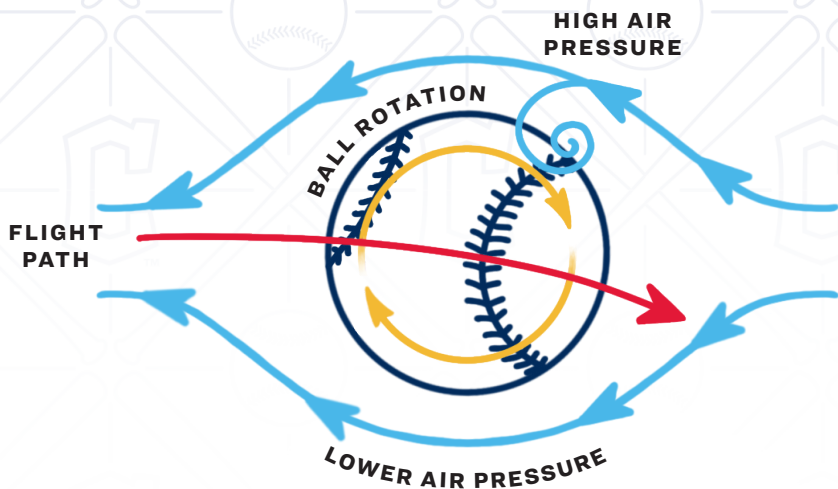
But being a great pitcher takes more than just throwing the ball hard - it's also about accuracy, control, and strategy. By mastering the art of pitching, you can become a valuable player and help your team succeed. So, are you ready to step up to the mound and become a pitching pro?

INTRO TO BERNOULLI

Daniel Bernoulli discovered the principle that allows airplanes to fly and found the first evidence for the existence of atoms in gasses. In baseball, Bernoulli's principle is the idea that the faster air moves over an object, the less pressure it exerts on that object.

This explains how a pitcher can make a ball curve or move in unexpected ways by changing the airflow around the ball as it's thrown. By using the Bernoulli principle to their advantage, pitchers can generate more lift on one side of the ball than the other, causing it to curve or break. This often involves holding the ball in a way that creates turbulence and changes the airflow, such as placing fingers in different positions or applying varying amounts of pressure.





CURVEBALL

A curveball is a type of pitch in baseball that looks like it's going straight but then suddenly drops or curves downward. To throw a curveball, hold the ball with your fingers on top and your thumb on the bottom, and apply pressure with your middle and index fingers while releasing the ball with a snapping motion. Batters have a hard time hitting curveballs because they're unpredictable and can change direction mid-flight.

FASTBALL

Fastballs can reach speeds of up to 100 miles per hour, making them a powerful tool for pitchers. To throw a fastball, grip the ball with your fingers behind it and your thumb underneath, and throw it with maximum speed and very little spin. It's the most basic and common pitch in the game, and pitchers often use it to try to strike out batters.



KNUCKLEBALL

A knuckleball is a pitch in baseball that has very little spin and moves in an unpredictable way as it travels toward the batter. Instead of being thrown with the fingers, the ball is held with the knuckles and released with a flick of the wrist.

CALCULATING THE VELOCITY OF A FASTBALL

How do we measure how fast a ball is thrown? Well, that's where the radar gun comes in! It sends out microwaves that bounce off the ball and then listens for the "whoosh" sound as it flies by and listens for the frequency shift in the returning waves caused by the ball's movement. By analyzing this frequency shift, the radar gun can calculate the speed of the pitch. It's all thanks to the magical science of the Doppler effect! The speed is displayed in mph and helps to evaluate the performance of pitchers and the speed of different pitches.

VELOCITY EQUATION

$$\text{VELOCITY } V = \frac{\Delta x}{\Delta t}$$

THE CHANGE IN DISTANCE
THE CHANGE IN TIME

TRY STEM AT HOME

The math behind Bernoulli's Principle principle seems complicated. That's why in STEM we use hands-on learning to help us with complex topics. You can learn more at home using materials around the house with these simple experiments found at **TeachEngineering Bernoulli's Principle** <https://www.teachengineering.org/populartopics/bernoulli>



STATIONARY BALL

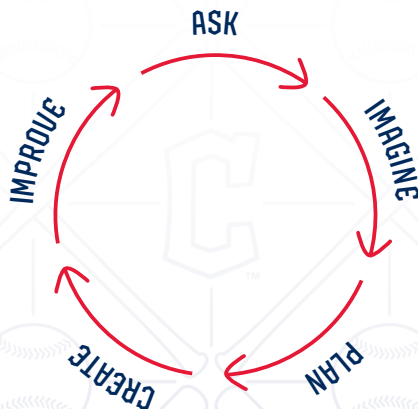
ENGINEERING AND THE DESIGN PROCESS

Now, let's talk about gear and equipment! Got a problem you need to solve? Want to invent something cool? Then let's follow the engineering design process! In a nutshell, you will ask questions, imagine ideas, plan it out, create a prototype, and improve it until it's perfect!

ASK, IMAGINE, PLAN, CREATE, IMPROVE

- 1. ASK:** What challenge needs to be solved or addressed? You might ask things like, "What is the problem?" or "What do we need to create?"
- 2. IMAGINE:** Next, start to brainstorm and imagine possible solutions. You can create sketches or diagrams to help them visualize your ideas.
- 3. PLAN:** Once you have ideas, start to plan out how you will create a solution. Think about materials, tools, or techniques you may need.
- 4. CREATE:** Now, create a model of your solution using simple materials like paper, playdoh, or craft materials. This is where the design really starts to take shape.
- 5. IMPROVE:** After creating the model, it's time to test and evaluate how well it works. Based on the results, you can make improvements to the design to make it work even better.

Overall, the engineering design process is a cycle that repeats until a satisfactory solution is reached. By following these steps, you can create innovative and effective products that solve real-world problems.



DESIGN LIKE A BOSS

MLB Celebrates many special occasions with custom jerseys! Let's see your engineering and design skills! Plan and draw your custom Guardian's jersey!



DESIGN PLAN

IDEA/THEME
LOGO/GRAPHICS
COLORS



STATISTICS IN SCOUTING

Baseball stats are used by the coaches, scouts, and analytics team to tell us how well a player is doing and can compare to past years and other teammates. They use this data to build the best lineup on the field for each game. The most common stats in baseball include batting averages, earned run averages, on base percentage, and runs batted in.

BATTING AVERAGE

The batting average tells you how good a player is at hitting the ball! A high batting average means they are a hitting machine and can score runs for the team!

$$\text{BATTING AVERAGE} = \frac{\text{HITS (H)}}{\text{AT BATS (AB)}}$$

ON BASE PERCENTAGE

The on base percentage (OBP) means how frequently a batter reaches base per plate appearance. A hitter's goal is to avoid getting out. The OBP show which hitter accomplished that task the best!

$$\text{ON BASE PERCENTAGE} = \frac{\text{HITS (H)} + \text{BASES ON BALLS (BB)} + \text{HIT BY PITCH (HBP)}}{\text{AT BATS (AB)} + \text{BASES ON BALLS (BB)} + \text{HIT BY PITCH (HBP)} + \text{SACRIFICE FLYS (SF)}}$$



JOSÉ RAMÍREZ

#11
B/T: S/R
Age: 31
Height: 5'9"
Weight: 190

PLAYER STATS

	AB	R	H	TB	HR	RBI
LIFE	4757	784	1327	2376	216	746

TRY OUT YOUR BASEBALL SCOUTING SKILLS

JOSÉ RAMÍREZ	GAMES (G)	AT BATS (AB)	RUNS (R)	HITS (H)	TOTAL BASES (TB)	HOME RUNS (HR)	RUNS BATTED IN (RBI)	BASES ON BALLS (BB)	HIT BY PITCH (HBP)	SACRIFICE FLYS (SF)
2023	156	611	87	172	290	24	80	73	1	6
Career	1293	4757	784	1327	2376	216	746	546	36	46

Can you calculate José Ramírez's 2023 Season batting average?

$$\text{BATTING AVERAGE} = \frac{H}{AB}$$

Can you calculate his 2023 Season on base percentage?

$$\text{ON BASE PERCENTAGE} = \frac{H + BB + HBP}{AB + BB + HBP + SF}$$

THINK OUTSIDE THE BATTER'S BOX

An entrepreneur is someone who creates something new – often a new product or a new business. But, being an entrepreneur isn't *just* about starting a business, it's really about how someone looks at the world around them. We often say that entrepreneurs **think outside the box**, which means they come up with fresh ideas and solutions to problems that may not have been tried before. It's never too early to start thinking like an entrepreneur. But, just like baseball, the more you practice, the better you will get.

.....

Let's think about what a batter's helmet is used for – to protect a baseball player's head from being hit by a fast ball. That's only one way that you could use this big rounded piece of plastic.

In this activity, think about what else you could do with a batter's helmet.

Challenge yourself to think of 9 different ways someone could use a batter's helmet. Could it be a snowshoe or a water bucket? Every idea is a good one. Your new use could hit it out of the park!

.....



1

2

3

4

5

6

7

8

9



BASEBALL LEGEND

HANK AARON

Hey, did you know that Hank Aaron, who played baseball from 1954 to 1976, is the all-time RBI leader in Major League Baseball (MLB) with an incredible 2,297 runs batted in? Aaron started his baseball career in the Negro Leagues, which were created because Black players were not allowed to play in the Major Leagues during the era of segregation. Aaron then went on to play in MLB starting in 1954, a time when racial tensions were still

high and segregation was still enforced in some parts of the country. Despite facing racism and discrimination throughout his career, Aaron was able to become one of the greatest players in baseball history and a symbol of hope and inspiration for Black Americans. In 1982, he was elected to the Baseball Hall of Fame and is widely regarded as one of the best players ever. Even today, his baseball statistics are still awe-inspiring!

RANK	PLAYER	RBI
1	Hank Aaron	2,297
2	Albert Pujols	2,218
3	Babe Ruth	2,214
4	Alex Rodriguez	2,086
5	Barry Bonds	1,996

THE PLAYER BIOLOGY

“Unlocking the Science of Baseball—How Biology Can Help You Crush It on the Field!”

STEM All-Stars! Did you know that biology can actually play a pretty big role in how well you play the game? Yup, it’s true! Things like reaction time, eye dominance, and hand-eye coordination are all influenced by your biology.

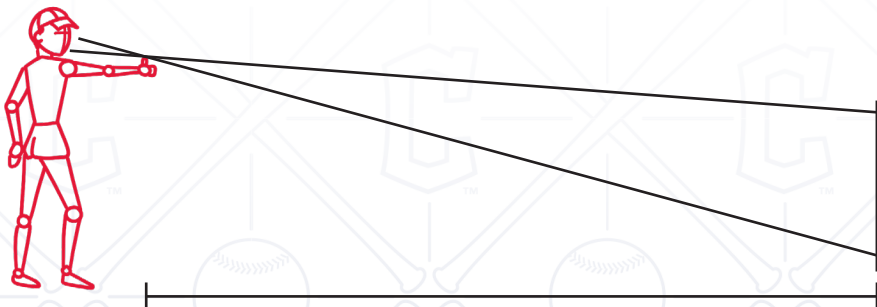
EYE DOMINANCE

Let’s start with eye dominance. Everyone has a dominant eye, which gives your brain the most accurate info. In baseball, this means that your dominant eye is super important for judging the speed and location of a pitch or tracking a fly ball. So, knowing which eye is dominant and training it to be even stronger can really help you out on the field.

TRY STEM

Here is a simple way to find your dominant eye:

1. Keep both eyes open and focused on a distant object, then extend your arm out and point with your thumb at the object.
2. Alternately close one eye at a time
3. The eye that keeps your finger directly in front of the object while the other eye is closed is your dominant eye.



REACTION TIME

Next up is reaction time. This is how fast you can respond to something, like a pitch or a ball heading your way. Your brain and muscles work together to process what's happening and react accordingly. So, the better your biology, the faster your reaction time, and the better you'll be at hitting or fielding the ball.

TRY STEM

What materials you'll need:

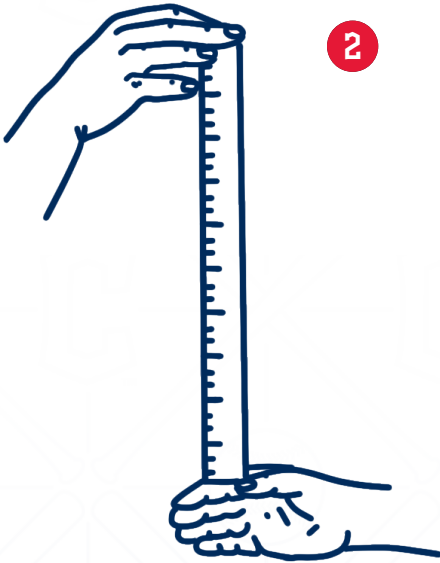
- » A ruler that's 12 inches/30 cm long
- » A STEM genius friend
- » Reaction time chart (see below)

	YOUR REACTION	FRIEND'S REACTION
Names		
1st Try		
2nd Try		
3rd Try		
Total		
Average		

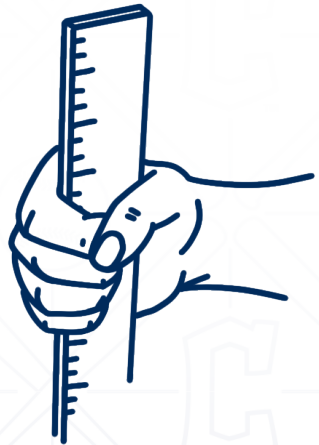
1



2



3



THE TEST!

1. Your friend picks up the ruler with the thumb and index finger. Make sure that your friend holds the ruler at the end with the highest measurement (12 in/30 cm) and let it hang freely.
2. Hold your arm in front of you. Open up your hand and spread your fingers. Your friend positions the dangling ruler above your hand. Make sure that the bottom edge of the ruler is even with the top of your spread fingers.
3. Get ready! Your friend will release the ruler without warning, letting it slip downward. The moment you see the ruler released, quickly close your hand.
4. Still holding the ruler, look at where the top edge of your hand meets the ruler. Record this “measurement” in the Reaction Time Chart.
5. Try this two more times. Then figure out the average by adding the three measurements and dividing the sum by three. This is the average distance that the ruler dropped before you stopped its fall.
6. Switch roles with your friend and repeat Steps 1 to 5 to find out who’s quicker. (The lower the number, the faster you are.) Practice makes perfect. Try this activity a few more times to improve your reaction time.

SUMMARY

Putting it all together— Hand-eye coordination

Putting it all together. How well you can coordinate your hands and eyes to do things like hit, catch, or throw the ball. It’s a combo of your nerves, muscles, and vision all working together. And you guessed it - better biology means better hand-eye coordination, which means better play on the field. By understanding how your biology affects your skills and working to improve them, you can become a real star player.

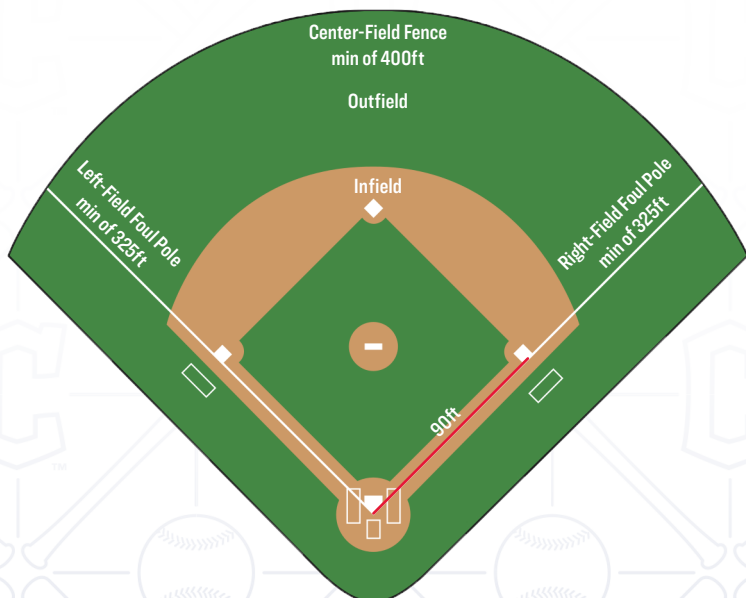
COMPUTER SCIENCE

Coding is also known as computer programming. It's how we communicate with computers and tell them what to do! Through coding professionals can build programs, websites and apps. The Guardians Analytics Team creates new coding daily to help them to organize and analyze the data to help the team get better!

BASEBALL CODING


Coding is also used to create computer games! Let's give it a try with these baseball coding Exercises! Use the Coding Key to complete these baseball exercises from the Guardians Game!

CODING KEY				
Run Forward	Turn Left	Turn Right	Step on Base	Hits Ball
↑	↶	↷	□	⚾



EXAMPLE

Steven Kwan hit a double. Write a program or code to show his at bat.

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
	↑ 90ft		↶ 90°	↑ 90ft	

1. Josh Naylor hit a single in the first inning. He overran 1st base by 20 feet. Write a program or code to show his at bat.

Step 1	Step 2	Step 3	Step 4

2. Andres Giménez hit a triple in the bottom of the third inning. Write a program or code to show his at bat.

Step 1	Step 2	Step 3	Step 4	Step 5
Step 6	Step 7	Step 8	Step 9	

3. José Ramírez hit a walkoff homerun to win the game! Write a program or code to show his at bat.

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Step 7	Step 8	Step 9	Step 10	Step 11	Step 12

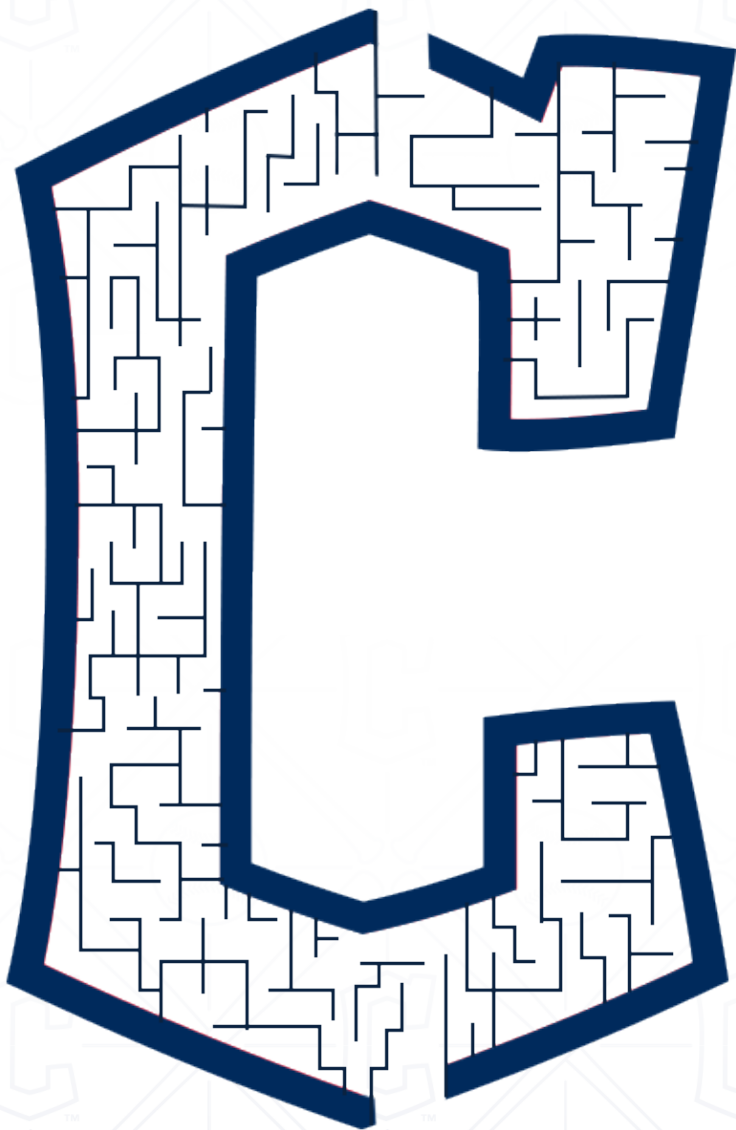
BASEBALL MATH

Can you solve these math problems?

- 1) If the bases are 90 feet away from each other, how many feet does it take to run all the way around the diamond three times?
- 2) The distance to the center field fence at Progressive Field is 410 feet, while the distance to the right field fence is 325 feet. How much farther does José Ramírez need to hit the ball for a home run to center field than he would need to hit a home run in right field?
- 3) Josh Naylor hit 1 home run, 2 doubles, and 1 single in a game, how many total bases did he collect?
- 4) If Triston McKenzie throws an average of 14 pitches per inning, and he pitched 7 innings in the game, how many total pitches did he throw?
- 5) If Stephen Kwan had 18 at bats in the last 5 games and his batting average is .265 over that time, how many hits did Josh record in the last 5 games?
- 6) If 120 baseballs are used in every game, and each of the 30 MLB teams play 162 games per season, how many total baseballs are used in a season? (Remember that each game has two teams playing in it)

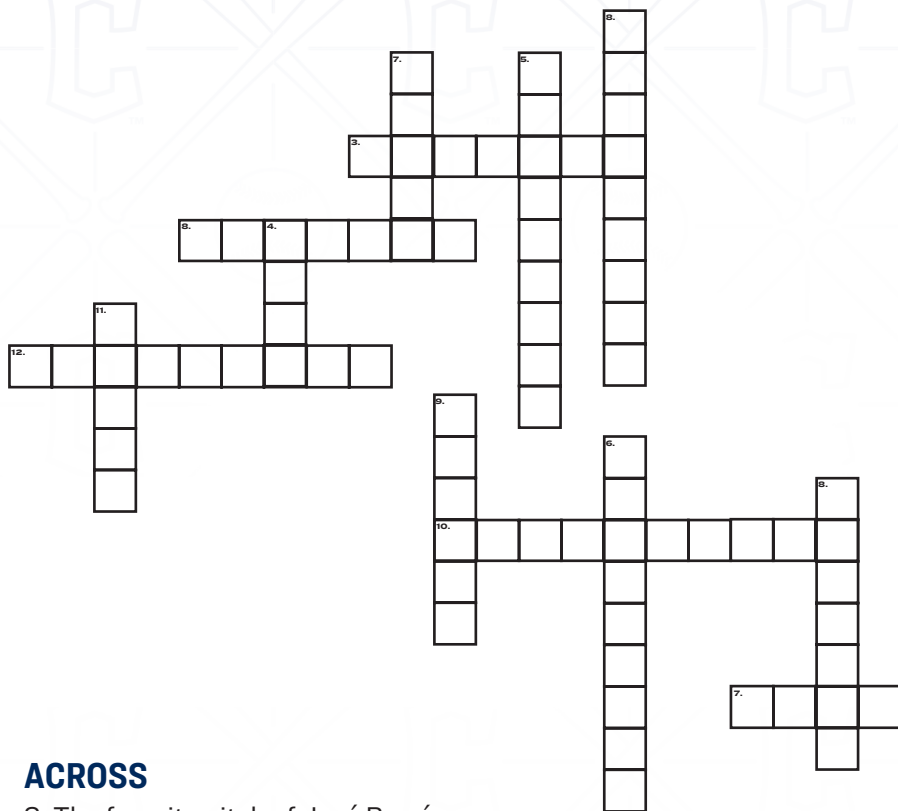
DIAMOND C MAZE

Try and go from start to finish in this tough maze.



CROSSWORD PUZZLE

Use the hints below to fill in all the blocks in the puzzle



ACROSS

3. The favorite pitch of José Ramírez
7. The number of innings played in a baseball game
8. The position Bo Naylor plays
10. A defensive play that results in two outs
12. When a pitcher throws three strikes against a batter

DOWN

1. Former Guardians first baseman who was inducted into the Baseball Hall of Fame in 2018
2. The name for a home run when the bases are loaded
4. The manager for the Guardians
5. These go off after a Guardians homerun and after the game
6. Award given to the best defensive players at their position
8. Award for best pitcher in the league (Shane Bieber won this in 2020)
9. A popular ballpark food (You may see them in a race during a home game)
11. When a player makes a mistake on defense

GUARDIANS QUIZ

- 1) Where do the Guardians play their home games?**
 - a. Rocket Mortgage Fieldhouse
 - b. Progressive Field
 - c. First Energy Stadium
 - d. Ohio Stadium
- 2) Which of these players is an outfielder?**
 - a. Triston McKenzie
 - b. Josh Naylor
 - c. Steven Kwan
 - d. Emmanuel Clase
- 3) What mascots have a race at every Guardians home game?**
 - a. Chocolate Bars
 - b. Hot Dogs
 - c. Burritos
 - d. Hamburgers
- 4) Which of the following is NOT one of the Guardians Hot Dogs?**
 - a. Mayonnaise
 - b. Mustard
 - c. Ketchup
 - d. Onion
- 5) What division do the Guardians play in?**
 - a. NL Central
 - b. AL East
 - c. NL West
 - d. AL Central
- 6) What color are Slider's spots?**
 - a. Blue
 - b. Green
 - c. Purple
 - d. Yellow
- 7) Which mascot was the 2023 Hot Dog Derby Champion?**
 - a. Onion
 - b. Mustard
 - c. Ketchup
 - d. Slider
- 8) Which of these Guardians players are NOT a pitcher?**
 - a. Andrés Giménez
 - b. Sam Hentges
 - c. Shane Bieber
 - d. James Karinchak
- 9) Who is the voice of the Guardians?**
 - a. Slider
 - b. Tom Hamilton
 - c. Stephen Vogt
 - d. José Ramírez
- 10) How many innings are there in a typical baseball game?**
 - a. 13
 - b. 7
 - c. 9
 - d. 18

WORD SCRAMBLE

Can you unscramble the following baseball terms?

RMACENIA GELEUA - _____

RSITKRSE - _____

IDLSRE - _____

DWLI RCDA MGEA - _____

RCKERAC AJKC - _____

UGDRIASNA - _____

PMV AAWDR - _____

LRVCELBAU - _____

ARUMDTS - _____

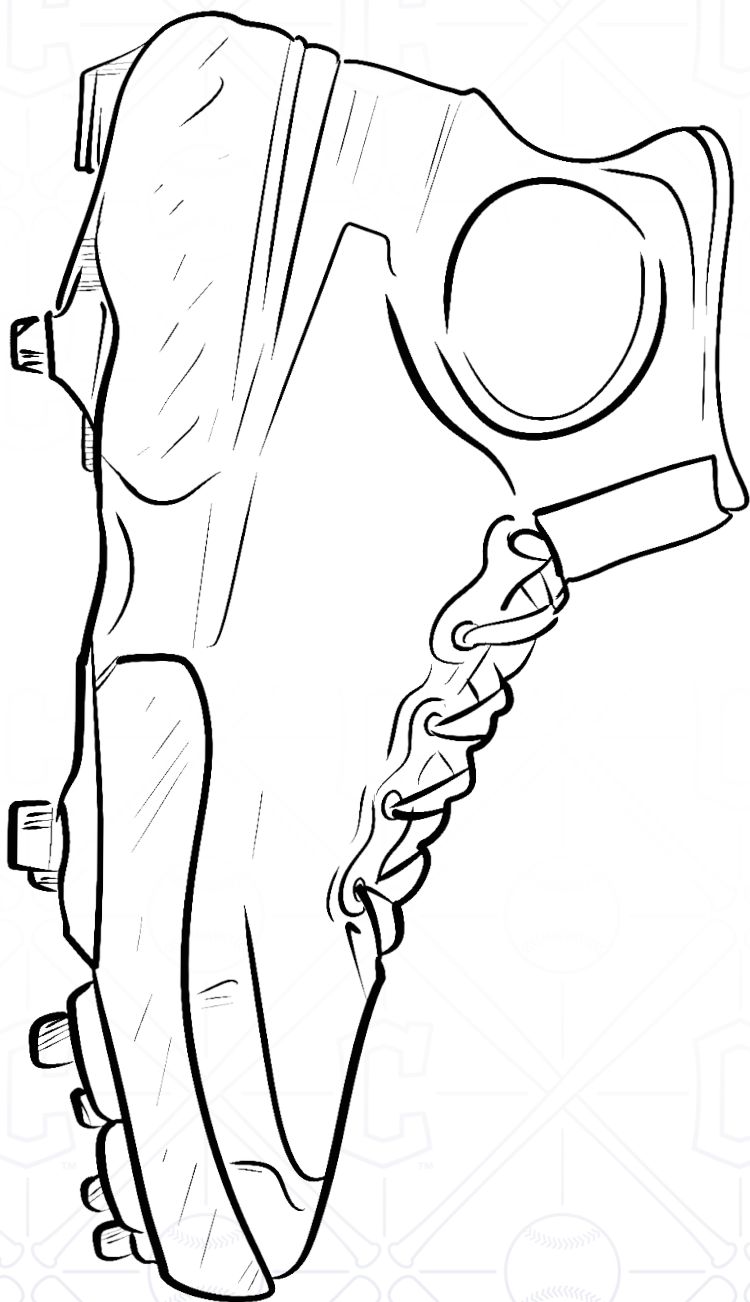
EIRPD - _____

CPPONRO - _____

PSGOEREVIRS LIFED - _____

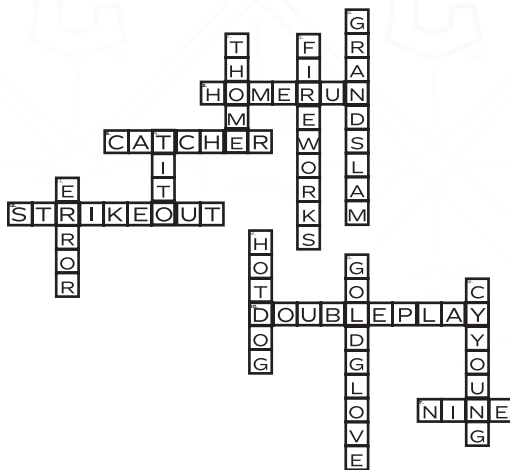
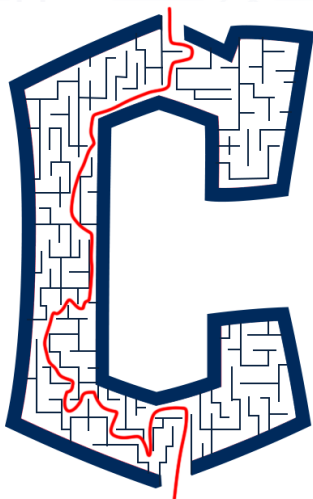
DESIGN YOUR OWN CLEATS

Want to be artsy like Andrés Giménez? Color your cleats with your own design.



ANSWER KEY

1) 1080 ft. 2) 85 ft. 3) 9 4) 98 5) 5 6) 291,600



1) B 2) C 3) B 4) A 5) D 6) D 7) C 8) A 9) B 10) C

- 1) AMERICAN LEAGUE
- 2) STRIKERS
- 3) SLIDER
- 4) WILD CARD GAME
- 5) CRACKER JACK
- 6) GUARDIANS

- 7) MVP AWARD
- 8) CURVEBALL
- 9) MUSTARD
- 10) PRIDE
- 11) POPCORN
- 12) PROGRESSIVE FIELD

CONCEPTS COVERED

NGSS framework for science education (middle school) aims to provide a clear and consistent understanding of what students are expected to learn in science and engineering. By focusing on three dimensions of science learning - disciplinary core ideas, science and engineering practices, and crosscutting concepts

MS-PS2-4: Students are expected to use mathematical representations to describe and predict the motion of objects in terms of position, velocity, and acceleration.

MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-4: Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

MS-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

MS-LS3-1: Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects on the structure and function of the organism.

MS-LS1-3: Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. This PE can be used to introduce students to the concept of the nervous system and how it interacts with other systems in the body to control bodily functions, including reaction time.

MS-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. This PE can be used to help students explore the role of genetics and environmental factors in determining eye dominance.

MS-LS1-8: Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. This PE can be used to help students understand how sensory receptors in the body, such as those in the eyes and ears, interact with the nervous system to allow for rapid responses to external stimuli.

MS-PS1-2: Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

2024 SCHEDULE

MARCH/APRIL

SUN	MON	TUE	WED	THU	FRI	SAT
24	25	26	27	28 10:07 PM	29 9:40 PM	30 4:07 PM
				OAK	OAK	OAK
31 4:07 PM	1 9:40 PM	2 9:40 PM	3 4:10 PM	4 4:10 PM	5	6 2:10 PM
OAK	SEA	SEA	SEA	MIN		MIN
7 2:10 PM	8 5:10 PM	9 6:10 PM	10 6:10 PM	11	12 7:10 PM	13 6:10 PM
MIN	CWS	CWS	CWS		NYN	NYN
14 1:40 PM	15 *11:10 AM	16 16	17 7:10 PM	18 *1:35 PM	19 7:10 PM	20 6:10 PM
NYN	BOS	BOS	BOS	BOS	OAK	OAK
21 1:40 PM	22	23 6:10 PM	24 6:10 PM	25 *1:10 PM	26 7:20 PM	27 7:20 PM
OAK		BOS	BOS	BOS	ATL	ATL

MAY

SUN	MON	TUE	WED	THU	FRI	SAT
			1 8:10 PM	2 8:10 PM	3 7:10 PM	4 8:10 PM
			HOU	HOU	LAA	LAA
5 1:40 PM	6 6:10 PM	7 6:10 PM	8 *1:10 PM	9 7:40 PM	10 7:40 PM	11 7:10 PM
LAA	DET	DET	DET	CWS	CWS	CWS
12 2:10 PM	13 8:05 PM	14 8:05 PM	15 8:05 PM	16	17 7:10 PM	18 6:10 PM
CWS	TEX	TEX	TEX		MIN	MIN
19 1:40 PM	20 6:10 PM	21 6:10 PM	22 *1:10 PM	23	24 9:38 PM	25 9:38 PM
MIN	NYM	NYM	NYM		LAA	LAA
26 4:07 PM	27 4:10 PM	28 8:40 PM	29 8:40 PM	30	31 7:10 PM	
LAA	COL	COL	COL		WSH	

JUNE

SUN	MON	TUE	WED	THU	FRI	SAT
						1 4:10 PM
						WSH
2 1:40 PM	3	4 6:40 PM	5 6:40 PM	6 *1:10 PM	7 7:10 PM	8 7:35 PM
WSH		KC	KC	KC	MIA	MIA
9 1:40 PM	10	11 7:10 PM	12 7:10 PM	13	14 7:07 PM	15 3:07 PM
MIA		CIN	CIN		TOR	TOR
16 1:37 PM	17	18 6:40 PM	19 6:40 PM	20 *1:10 PM	21 7:10 PM	22 4:10 PM
TOR		SEA	SEA	SEA	TOR	TOR
23 1:40 PM	24	25 6:35 PM	26 6:35 PM	27 8:10 PM	28 8:10 PM	29 4:10 PM
TOR		BAL	BAL	KC	KC	KC

JULY

SUN	MON	TUE	WED	THU	FRI	SAT
	1	2 6:40 PM	3 6:40 PM	4 *1:10 PM	5 7:10 PM	6 4:10 PM
		CWS	CWS	CWS	SF	SF
7 1:40 PM	8 6:40 PM	9 6:40 PM	10 6:40 PM	11 *1:10 PM	12 6:50 PM	13 4:10 PM
SF	DET	DET	DET	DET	TB	TB
14 1:40 PM	15	16	17	18	19 7:10 PM	20 7:10 PM
TB		ASG			SD	SD
21 1:40 PM	22 6:40 PM	23 6:40 PM	24 6:40 PM	25 *1:10 PM	26 6:40 PM	27 6:05 PM
SD	DET	DET	DET	DET	PHI	PHI
28 1:35 PM	29 6:40 PM	30 *1:10 PM	31			
PHI	DET	DET				

AUGUST

SUN	MON	TUE	WED	THU	FRI	SAT
				1 6:40 PM	2 7:10 PM	3 7:15 PM
				BAL	BAL	BAL
4 1:40 PM	5 6:40 PM	6 6:40 PM	7 *1:10 PM	8	9 8:10 PM	10 7:10 PM
BAL	AZ	AZ	AZ		MIN	MIN
11 2:10 PM	12 6:40 PM	13 6:40 PM	14 6:40 PM	15	16 8:10 PM	17 7:15 PM
MIN	CHC	CHC	CHC		MIL	MIL
18 2:10 PM	19	20 7:05 PM	21 7:05 PM	22 1:05 PM	23 7:10 PM	24 7:10 PM
MIL		NYN	NYN	NYN	TEX	TEX
25 1:40 PM	26 6:40 PM	27 6:40 PM	28 *1:10 PM	29	30 7:10 PM	31 6:10 PM
TEX	KC	KC	KC		PIT	PIT

SEPTEMBER

SUN	MON	TUE	WED	THU	FRI	SAT
1 2:40 PM	2 4:10 PM	3 7:40 PM	4 7:40 PM	5	6 10:10 PM	7 9:10 PM
PIT	KC	KC	KC		LAD	LAD
8 4:10 PM	9 7:40 PM	10 7:40 PM	11 *2:10 PM	12 6:40 PM	13 7:10 PM	14 6:10 PM
LAD	CWS	CWS	CWS	TB	TB	TB
15 1:40 PM	16 6:40 PM	17 6:40 PM	18 6:40 PM	19 *1:10 PM	20 8:15 PM	21 7:15 PM
TB	MIN	MIN	MIN	MIN	STL	STL
22 2:15 PM	23	24 6:40 PM	25 6:40 PM	26	27 7:10 PM	28 8:10 PM
STL		CIN	CIN		HOU	HOU
29 3:10 PM	30					
HOU						

HOME
 AWAY
 WALMART
 100TH ANNIVERSARY
 Red Bull SPORTS CENTER
 FOX SPORTS
 ESPN
 FOX
 peacock
 Apple

All games will air on WTAM/WMMS/GRN, with the exception of weekday day games, which will not air on WMMS.

All game dates and times are subject to change. Schedule tentative as of March 2023.

2024 PROMOTIONAL SCHEDULE

MAY

- Fri. 17 Free Shirt Friday ■ **PHANTOM FIREWORKS**, Sugardale Dollar Dog Night, Phantom Fireworks **DollarBank**
- Sat. 18 José Ramírez Bobblehead ◆, Phantom Fireworks
- Sun. 19 Kids Fun Day, Kids Run the Bases **Cleveland Clinic Children's**
- Fri. 31 Free Shirt Friday ■ **PHANTOM FIREWORKS**, Sugardale Dollar Dog Night, Phantom Fireworks, Asian American Pacific Islander Celebration **NESSO**

JUNE

- Sat. 1 Steven Kwan Jersey ▲ **M**
- Sun. 2 Kids Fun Day, Kids Run the Bases **Cleveland Clinic Children's**
- Wed. 19 Tote Bag ■ **PEPSI**
- Fri. 21 Free Shirt Friday ■ **PHANTOM FIREWORKS**, Sugardale Dollar Dog Night, Phantom Fireworks **NESSO**, Pride Celebration **NESSO**
- Sat. 22 Josh Naylor Bobblehead ▲ **MEDICAL MUTUAL**, DIESEL/Shaquille O'Neal Post-game Concert
- Sun. 23 Kids Fun Day, Kids Run the Bases **Cleveland Clinic Children's**

JULY

- Wed. 3 Hawaiian Shirt ▲ **Sugardale**, Sugardale Dollar Dog Night, Phantom Fireworks **Weyandt**
- Fri. 5 Free Shirt Friday ■ **PHANTOM FIREWORKS**, Phantom Fireworks, Larry Doby Celebration **NESSO**
- Sat. 6 Triston McKenzie Bobblehead ▲ **W**
- Sun. 7 Kids Fun Day, Kids Run the Bases
- Fri. 19 Free Shirt Friday ■ **PHANTOM FIREWORKS**, Sugardale Dollar Dog Night, Phantom Fireworks
- Sat. 20 Bo Naylor Jersey ▲ **M**, Phantom Fireworks **Bally Sports**
- Sun. 21 Kids Fun Day, Kids Run the Bases **Cleveland Clinic Children's**
- Wed. 24 Disability Awareness Celebration **NESSO**
- Thur. 25 Beach Towel Giveaway ■ **NESSO**

AUGUST

- Fri. 2 Free Shirt Friday ■ **PHANTOM FIREWORKS**, Sugardale Dollar Dog Night, Phantom Fireworks **LECOM**
- Sat. 3 Guardians Hall of Fame Inductee Bobblehead ▲ **Drug Mart**, Guardians Hall of Fame Induction Ceremony, Phantom Fireworks **SHEETZ**
- Sun. 4 Kids Fun Day, Kids Run the Bases **Cleveland Clinic Children's**
- Wed. 14 Belt Bag ■ **meijer**
- Fri. 23 Rock 'n' Blast **ECHO**, Free Shirt Friday ■ **PHANTOM FIREWORKS**, Sugardale Dollar Dog Night
- Sat. 24 Rock 'n' Blast **ECHO**, Guardians Flag ▲ **LEXUS**
- Sun. 25 Kids Fun Day, Kids Run the Bases **Cleveland Clinic Children's**
- Fri. 30 Free Shirt Friday ■ **PHANTOM FIREWORKS**, Sugardale Dollar Dog Night, Phantom Fireworks
- Sat. 31 Andrés Giménez Jersey ◆ **DollarBank**, Phantom Fireworks

SEPTEMBER

- Sun. 1 Kids Fun Day, Kids Run the Bases **Cleveland Clinic Children's**
- Fri. 13 Noche Latina Hispanic Heritage Celebration **NESSO**
- Sat. 14 Lightweight Hoodie Giveaway ■ **Wendy's**
- Sat. 28 Sugardale Dollar Dog Night, Phantom Fireworks, Fan Appreciation Night, 2025 Schedule Poster **77X**
- Sat. 29 Kids Fun Day, Kids Run the Bases **Cleveland Clinic Children's**

○ All Fans ■ 10,000 Fans ◆ 12,500 Fans ▲ 15,000 Fans
Promotional Calendar Subject to Change.

