



IGNITE MY FUTURE

FAMILY ACTIVITY

Score!

ACTIVITY TIME

30–45 minutes, depending on level selected.
The “Player” section of the activity requires you to collect data over the course of a few weeks.

MATERIALS NEEDED

- Pencil
- Paper
- About 100 small candies, tokens, cards, or other small objects that can be arranged in rows
- Team Stats Sheet
- Player Stats Sheet
- Computer with Internet access and a spreadsheet software program (these are optional for the beginner level and necessary for the advanced level)





Background Information

Do you love playing sports? Are you part of a fantasy sports league? Do you enjoy sports video games? How about watching sports and learning about sports? There are lots of careers in the sports industry, and they're not just for athletes! One way that you can prepare for a career in the sports industry is by learning how to analyze data.

Data help us make sense of many things. Some data are quantitative, meaning they are based on things we can measure. Quantitative data help us measure concrete things such as weight and distance. Other data are qualitative, which means they can't easily be measured. Qualitative data include things like memories and descriptions.

Many steps are involved in analyzing data. First, you have to collect the data. Then, you need to identify variables. Variables are the pieces of the data that you want to measure and count. Finally, you have to put those variables together in a certain way so that the data can tell you its story. Data experts use models to do this. Models are illustrations that gather lots and lots of variables together in a way that makes them easy to understand. Models help us see the relationships between things, identify causes, and even predict the future. Here are some things that you might not have realized are models:

- Weather forecasts
- Maps
- Predictions about your favorite sports teams

So, how do sports analysts know what teams and players will do well? This exercise will teach you how to answer this question by showing you how sports professionals use the computational thinking strategies of collecting and analyzing data to make predictions.



Blueprint for Discovery: BEGINNER

Phase 1: Collect Data

- 1 You'll use** the [Team Stats Sheet](#) for this activity.
- 2 First, decide which sports team** you would like to learn about. If you have access to the Internet, find the team's official site or another website dedicated to counting the number of wins and losses each season. If you don't have Internet access, you can use the sports section of a newspaper or a memorabilia book about the team to collect these data.
- 3 Using paper and pencil**, record wins and losses for your team for at least 5 to 10 years, or longer if possible.



Blueprint for Discovery: BEGINNER

Phase 2: Analyze Data and Create a Computational Model

- 1 It's time to analyze your data!** Use the [Team Stats Sheet](#) for this activity.
- 2 Pick 5 to 10 years** of win/loss records from your team statistics research. Now, lay out small objects (candies, tokens, or cards) for the wins in each year. For example, if the team had five wins in the first year of data you collected, place five objects in a row. Then, if the team won seven games in the second year of data you collected, place seven objects in that row. Lay out objects for each row to represent number of wins for that year.
- 3 Take a look at all the rows.** What kinds of patterns do you see? Do the rows go up or down? Or is there a curve or a slant? If there is a curve or slant, in which direction does it go?
- 4 Let's try finding the average wins per year.** This can help you determine the number of wins in future years.
 - Count the number of rows and write that number here: Years _____
 - Add all the wins for every year and write that number here: Wins _____
 - Divide the wins by the years to get the average wins per year.

$$\frac{\text{Wins}}{\text{Years}} \div \text{Years} = \text{_____ wins per year}$$

- 5 Go back to your rows of objects.** Take one object from the longest row and add it to the shortest row. Keep doing that until all the rows are as even as possible. What number did you get? Is it close to the "wins per year," or "average"? Based on the number of wins in all the seasons you counted, predict the number of wins the team will have in the upcoming season.
- 6 Reset the rows** to show all the years of wins again. Now, use only the last two seasons. How did that affect the average? Based on the number of wins in just the past two seasons, predict the number of wins the team will have in the upcoming season.



Blueprint for Discovery: BEGINNER Phase 3: Make Predictions

- 1 Use** the [Player Stats Sheet](#) for this activity.
- 2 Find several statistics on a sports player** who is likely to be traded or drafted. If you're researching a soccer player, look for statistics such as the number of goals scored. If you're looking at a basketball player, look for statistics such as the average number of points scored in a game or number of assists. If you are analyzing a baseball player, you will want statistics such as batting average and runs batted in (RBIs). If you're looking at a football player, look for statistics such as number of touchdowns scored and total rushing or passing yards. You can use the Internet to look at sports news websites for these data, or you can look in the sports section of a newspaper.
- 3 Find several teams in the league** that would benefit from the skills of the player you picked.
- 4 Write down each team and its needs.** Use the same types of statistics as you gathered for your team player.
- 5 Circle** the teams with needs in the same statistic category as your team player's strengths.
- 6 Over the next few weeks,** write down which teams met with the player.
- 7 Read press releases** on the Internet or in newspapers and research your player's recent activities. Write down any additional activities for the player.
- 8 Using the data** and other information you collected, make a prediction. What teams met with your team player? How many times did they meet? Did they make any offers?
- 9 Wait** for the news about your team player's decision, and see if you were right!



Blueprint for Discovery: **ADVANCED**

Phase 1: Gather Data

Note: You will need Internet access and a spreadsheet program.

- 1 Search the Internet** for statistics about your favorite sports team. Start by finding the team's official site or another website dedicated to counting the number of wins and losses each season. You might also try the team social media page or call a sports memorabilia store.
- 2 Using paper and pencil,** record wins and losses for your team for at least 5 to 10 years, or longer if possible.



Blueprint for Discovery: **ADVANCED** Phase 2: Analyze Data and Create a Computational Model

- 1 It's time to analyze your data!** Use the [Team Stats Sheet](#) for this activity.
- 2 Pick between 5 and 10 years of win/loss** records from your team statistics research. Now, lay out small objects (candies, tokens, or cards) for the wins in each year. For example, if the team had five wins in the first year of data you collected, place five objects in a row. Then, if the team won seven games in the second year of data you collected, place seven objects in that row. Lay out objects for each row to represent number of wins for that year.
- 3 Take a look at all the rows.** What kinds of patterns do you see? Do the rows go up? Down? Or is there a curve or a slant? If there is a curve or slant, in which direction does it go?
- 4 Let's try finding the average wins per year.** This can help you determine the number of wins in future years.
 - Count the number of rows and write that number here: Years _____
 - Add all the wins for every year and write that number here: Wins _____
 - Divide the wins by the years to get the average wins per year.

$$\frac{\text{Wins}}{\text{Years}} \div \text{Years} = \text{Wins per year}$$

- 5 Go back to your rows of objects.** Take one object from the longest row and add it to the shortest row. Keep doing that until all the rows are as even as possible. What number did you get? Is it close to the "wins per year," or "average"? Based on the number of wins in all the seasons you counted, predict the number of wins the team will have in the upcoming season.
- 6 Reset the rows** to show all the years of wins again. Now, use only the last two seasons. How did that affect the average? Based on the number of wins in just the past two seasons, predict the number of wins the team will have in the upcoming season.



Blueprint for Discovery: **ADVANCED** Phase 3: Use a Computer to Analyze Data

What if you could use a computer to calculate the possibility of future wins of a team based on wins in the prior seasons? How can we do that really fast? Let's use a computer and a spreadsheet program to find out!

1 Open **Microsoft Excel** or a similar program and click on "New Blank Workbook."

2 Type in the following years as seen below in cells A1-I1.

	A	B	C	D	E	F	G	H	I
1	2010	2011	2012	2013	2014	2015	Total Wins	Seasons	Average
2									

3 In cells **A2-I2**, type: 5, 3, 2, 6, 8, 9 for the wins each year.

	A	B	C	D	E	F	G	H	I
1	2010	2011	2012	2013	2014	2015	Total Wins	Seasons	Average
2	5	3	2	6	8	9			

4 In cell **G2**, enter the following formula: **=A2+B2+C2+D2+E2+F2**

	A	B	C	D	E	F	G	H	I
1	2010	2011	2012	2013	2014	2015	Total Wins	Seasons	Average
2	5	3	2	6	8	9	33		

The result in cell G2 will be the total wins in all years.

5 In cell **H2**, enter the total number of seasons.

	A	B	C	D	E	F	G	H	I
1	2010	2011	2012	2013	2014	2015	Total Wins	Seasons	Average
2	5	5	2	6	5	9	33	6	

6 In cell **I2**, enter the following formula: **=G2/H2**

	A	B	C	D	E	F	G	H	I
1	2010	2011	2012	2013	2014	2015	Total Wins	Seasons	Average
2	5	5	2	6	5	9	33	6	5.5

The result in cell I2 will be the average wins per year.

7 Now try this with your data!

Find more easy-to-implement resources to integrate computational thinking practices into your classroom by visiting ignitemyfutureinschool.org



Blueprint for Discovery: **ADVANCED** Phase 3: Make Predictions

- 1 Use** the [Player Stats Sheet](#) for this activity.
- 2 Find several statistics** on a sports player who is likely to be traded or drafted. If you're researching a soccer player, look for statistics such as the number of goals scored. If you're looking at a basketball player, look for statistics such as the average number of points scored in a game or number of assists. If you are analyzing a baseball player, you will want statistics such as batting average and runs batted in (RBIs). If you're looking at a football player, look for statistics such as number of touchdowns scored and total rushing or passing yards. You can use the Internet to look at sports news websites for these data, or you can look in the sports section of a newspaper.
- 3 Find several teams** in the league that would benefit from the skills of the player you picked.
- 4 Write down each team and its needs.** Use the same types of statistics as you gathered for your team player.
- 5 Circle the teams** with needs in the same statistic category as your team player's strengths.
- 6 Over the next few weeks,** write down which teams met with the player.
- 7 Read press releases** on the Internet or in newspapers and do your research about the player's recent activities. Write down any additional activities for the player.
- 8 Using the data and other information you collected,** make a prediction. What teams met with your team player? How many times did they meet? Did they make any offers?
- 9 Wait for the news** about your team player's decision, and see if you were right!

Team Stats Sheet

Gather Data

Place the objects in rows for each season here:

Row 1 - W

L

Row 2 - W

L

Row 3 - W

L

Row 4 - W

L

Row 5 - W

L

Sort Data

Team: _____

Season: _____ Wins: _____ Losses: _____

Total: _____ Wins: _____ Losses: _____

Calculate Winning Percentage

$\frac{\text{Wins}}{\text{Years}} = \text{_____ wins per year}$

 Find more easy-to-implement resources to integrate computational thinking practices into your classroom by visiting ignitemyfutureinschool.org

Player Stats Sheet

Player Name: _____

Stat 1: _____

Stat 2: _____

Stat 3: _____

Stat 4: _____

Stat 5: _____

Circle the strongest looking statistic(s) and write it down:

Teams in Need:

Team: _____

Weak Stat: _____

News and Research:

Prediction: