The Bruins I.C.E. School
Math – 3rd – 5th Grade Curriculum Materials

Lesson 1: Line Plots

Lesson 2: Bar Graphs

Lesson 3: Mean, Median, Mode, Range, Maximum and Minimum

Lesson 4: Classifying Angles

Lesson 5: Decimals

Worksheets Included:
- Diagram of standard ice hockey rink
- Ice Rink Angles Worksheet
- Ice Rink Angles Worksheet – Answer Key
- Jersey Master
- Goalie Trading Cards

Please see each lesson plan for the frameworks that apply to that lesson.
Lesson 1: Line Plots

Concept/Topic to Teach: Students construct a line plot using the last names of the Boston Bruins players.

Standards Addressed
- 4.D.3 Construct, draw conclusions, and make predictions from various representations of data sets, including tables, bar graphs, pictographs, line plots, line graphs, and tallies.

General Goal(s) – Expected Outcome
- Students will construct and interpret a line plot.

Specific Objectives
- Students will construct a line plot from given information.

Required Materials
- Z is for Zamboni: A Hockey Alphabet by Matt Napier
- Boston Bruins Roster
- Ruler
- Paper

Introduction
- Read Z is for Zamboni: A Hockey Alphabet
- Ask students what they know about the Boston Bruins.
- Ask students to brainstorm names of players on the Bruins.
- Explain to the students that Blades wants to learn the names of the Boston Bruins.

Modeling/Explanation
- Tell students that we are going to create a type of graph called a line plot.
- Show different examples of line plots and explain how to construct a line plot.
- Create a line plot together as a whole class.

Independent Practice
- Give students a copy of the Boston Bruins Roster.
- Explain to students they will construct a line plot of the number of letters in the players’ last names.
Accommodations
  Adaptations (for Students with Learning Disabilities)
  • Have students choose only 10 forwards, 2 defensemen and 1 goalie.
  • Give students a sheet with the line already on the paper with or without the numbers depending on the students’ ability.

Extensions (For Gifted Students)
  • Have students analyze the information.
  • Draw conclusions about the data gathered from the line plot.
  • Find the mean, median, mode, minimum, maximum, and range.

Check for Understanding
  • Monitor progress and make corrections as needed while students are working.
  • Check finished line plots for accuracy.

Closure/Wrap-Up
  • Write a letter to one of the players to request a class visit.

Evaluation
  • Observation of students work.
  Evaluate finished line plots for accuracy.
Lesson 2: Bar Graphs

Concept/Topic to Teach: Students construct a bar graph of the birthplaces of the Boston Bruins players.

Standards Addressed
- **4.D.3** Construct, draw conclusions, and make predictions from various representations of data sets, including tables, bar graphs, pictographs, line plots, line graphs, and tallies.

General Goal(s) – Expected Outcome
- Students will construct and interpret a bar graph.

Specific Objectives
- Students will construct a bar graph.
- Students will label the axes.
- Students will create an appropriate title for the bar graph.
- Students will determine a proper scale and interval and correctly put it on the bar graph.

Required Materials
- Boston Bruins by Vartan Kupelian
- Boston Bruins Roster
- Ruler
- Graph Paper
- World Map

Introduction
- Read Boston Bruins by Vartan Kupelian.
- Ask students what they know about hockey and the Boston Bruins.
- Ask students to brainstorm names of current players on the Bruins.
- Explain to the students that Blades wants to learn where the players for the Bruins are from.
- Show the students a world map.
- Tell them Blades wants to travel to the countries where the Boston Bruins are from.
- Ask the students to find on a map the different countries the players are from.
Modeling/Explanation
- Explain to the students that we are going to make the information more organized so it is easier for Blades to read and understand.
- Ask students if they know how we can organize the information. Guide the discussion to graphs.
- Ask the students what would be the best type of graph to show this information. Guide them to a bar graph.
- Ask them to discuss with each other what are different things the graph should have (i.e., x and y axis, title, labels, scale).
- Construct a model together. Discuss how to determine a scale.

Independent Practice
- Using the Boston Bruins roster tell the students they are to create a bar graph showing the birthplace of the players.
- Students will construct a graph with an x and y axis, title, labels, and scale.

Accommodations:
Adaptations (For Students with Learning Disabilities)
- Give a pre-made x and y axis.
- Give the scale.

Extensions (For Gifted Students)
- Have students analyze the information. Draw conclusions about the data gathered from the bar graph.
- Find the mean, median, mode, minimum, maximum, and range.
- Using different data (i.e., season by season comparison from Bruins website) create a double bar graph

Check for Understanding
- Monitor progress and make corrections as needed while students are working.
- Check finished bar graphs for accuracy.

Closure/Wrap-Up
- Talk about why there are so many players from Canada and the significance of hockey in Canada

Evaluation
- Observe student progress as they work.
- Check finished graphs for accuracy.
Lesson 3: Mean, Median, Mode, Range, Maximum and Minimum

Concept/Topic to Teach: Students find the mean, median, mode, maximum and minimum, and range of the Boston Bruins players’ ages.

Standards Addressed
- 6.D.1 Describe and compare data sets using the concepts of mean, median, mode, maximum and minimum, and range.

General Goal(s) – Expected Outcome
- Students will be able to describe and compare data sets using the concepts of mean, median, mode, maximum and minimum, and range.

Specific Objectives
- Students will be able to find the mean (average) for a set of data.
- Students will be able to find the median of a set of data and understand that median is the middle number in a set of data.
- Students will find the mode of a set of data and understand that the mode is the number that occurs the most in a set of data.
- Students will find the maximum number in a set of data.
- Students will find the minimum number in a set of data.
- Students will find the range of a set of data and understand that range is the difference between the maximum and minimum numbers in a set of data.

Required Materials
- Hockey For Fun by Sandra Will
- Boston Bruins Roster
- Boston Bruins Jersey Master

Introduction
- Read Hockey For Fun to help students gain an understanding of how hockey is played.
- Explain to students that they are going to put together a starting line-up for the Boston Bruins using a copy of the roster.
Students will use the jersey templates and create a team of 3 forwards, 2 defensemen, and a goalie from the roster. Students can write the players name and number on the jersey.
Modeling/Explanation
- Explain to students that they are going to take their starting line-up and find the mean, median, mode, maximum, minimum, and range of the players’ ages.
- Discuss what mean, median, mode, maximum, minimum, and range are and how to find them.
- Do some examples together of random numbers. When you feel the students have had enough practice, have them work to find the mean, median, mode, maximum, minimum, and range for the ages of the players they have chosen.

Independent Practice
- First start with the 5 players skating (3 forwards and 2 defensemen).
- Find the mean, median, mode, maximum, minimum, and range of the ages of these 5 players.
- Then do the same, but put one of the players in the penalty box.
- Then find the mean, median, mode, maximum, minimum, and range with the goalie as well.
- After the students try this have them discuss with each other anything they noticed.
- Talk about what happens to the median with only 4 players or when you add the goalie.
- Discuss what happened and how you would find the median in that case.

Accommodations:
- Adaptations (For Students with Learning Disabilities)
  - Work with these students in a small group or one on one if there is an assistant.
- Extensions (For Gifted Students)
  - Find the mean, median, mode, minimum, maximum and range of ages of all the forwards.
  - Find the mean, median, mode, minimum, maximum and range of ages of all the defense.
  - Find the mean, median, mode, minimum, maximum and range of ages of all the goalies.

Find the mean, median, mode, minimum, maximum and range of ages of players on other teams and compare that data to that of the Boston Bruins and draw conclusions.

Check for Understanding
- Monitor understanding by questioning students on what they discover.

Closure/Wrap-Up
- Make a generalization about the average age of players in the NHL, based on the students’ discoveries about the Boston Bruins.

Evaluation
Have students create another line-up and complete for homework
Lesson 4: Classifying Angles

Concept/Topic to Teach: Students will determine the most likely place to score a goal from when a player takes a shot based on the scoring angle of the player to the net.

Standards Addressed:
- 6.M.2: Identify, measure, describe, classify, and construct various angles, triangles and quadrilaterals.

General Goal(s) – Expected Outcome:
- Students will identify, measure, describe and draw four types of angles (right, acute, obtuse, straight).

Specific Objectives:
- Students will be able to define a right, acute, obtuse and straight angle.
- Students will be able to measure angles.
- Students will be able to construct angles.
- Students will be able to classify angles.

Required Materials:
- Diagram of standard ice hockey rink
- Website
  - www.rennemann.org/hockey/shooting/scoring_angles.aspx
- Protractor

Introduction
- Listen to the podcast recap of Game 7 of the Eastern Conference Semi-Finals of the shots on Tim Thomas, or watch a video clip of a save Tim Thomas made.
- Give the students a copy of the rink diagram.
- Have them discuss with each other where it is easier to score a goal from and where it is more difficult to score a goal.

Guide the discussion to the scoring angle.
Modeling/Explanation

- Show the students a diagram of a scoring angle in hockey.
- Explain to the students the different types of angles.
- Show examples of the different types of angles.
- Have the students come up with definitions for each type of angle and write in their journal.
- Show students how to measure angles using a protractor.

![Diagram of a scoring angle in hockey](image)

Independent Practice

- Give students a copy of the diagram in the additional resources.
- Have them draw an angle for each letter using the diagram above.
- Have the students predict what type of angle it is (right, acute, obtuse or straight).
- Then have them measure the angle with a protractor.
- Label each angle on the diagram as right, acute, obtuse or straight.
- Write the measurement for each angle.
- Have students share their diagrams with each other and talk about them. Is there anywhere on the rink that they could draw an obtuse angle from and still score a goal?

Accommodations:

Adaptations (For Students with Learning Disabilities)

- Give a diagram with the angles already drawn.

Extensions (For Gifted Students)

Draw and label the angles of this diagram.
Check for Understanding

- Observe and monitor students as they are working.

Closure/Wrap-Up

- Discuss where the most likely place to score from is and why (the slot).
- Explain that most goals are made from this area.
- Discuss what hockey announcers mean when they say, “The goalie has come out of his net to block down the shooter’s angle.”

Evaluation

- Evaluate students’ diagrams with angles.

Additional Teacher Background

- The slot in hockey is the area in front of the net that is the most likely place to score a goal from. Most goals are made from this area.

Additional Teacher Resources

Teaching Math Through Sports – Grades 5-8, On the Mark Press
Lesson 5: Decimals

Concept/Topic to Teach: Students will use the top five goaltending leaders in save percentages and goals against stats to review decimals.

Standards Addressed:
- **6.N.2** Demonstrate an understanding of place value to billions and thousandths.
- **6.N.3** Represent and compare very large (billions) and very small (thousandths) positive numbers in various forms such as expanded notation without exponents.
- **6.N.7** Compare and order integers (including negative integers), and positive fractions, mixed numbers, decimals, and percents.
- **6.N.13** Accurately and efficiently add, subtract, multiply and divide (with double-digit divisors) whole numbers and positive decimals.

General Goal(s) – Expected Outcome:
- Students will explore positive decimals to thousandths.

Specific Objectives:
- Students will read and write decimals.
- Students will identify decimal place value to thousandths.
- Students will compare and order decimals.
- Students will add and subtract decimals.

Required Materials:
- Goalie stats from National Hockey League website
  - [http://www.nhl.com/ice/statshome.htm](http://www.nhl.com/ice/statshome.htm)
- Video clips of Tim Thomas saves
- Goalie trading cards

Introduction
- Ask the students if they know who the Boston Bruins starting goalie is.
- Ask if they know any other goalies around the league

Discuss the goalie statistics of save percentage and goals against.
Modeling/Explanation

- Review the concept of decimals and decimal place value to the thousandths.
- Tell students this is a culminating activity to practice what they have learned about decimals.

Independent Practice

- Give each student a copy of the goalie trading cards. Have them cut out the cards.
- Have the students read the cards to each other including reading the decimal numbers correctly.
- Have students write the decimal in written form on the cards.
- Ask students to identify place values of the statistics.
- Tell them to put the cards in order from least to greatest of goals against average.
- Do the same for save percentage.
- Have students compare Tim Thomas’ goals against average with the other goalies.
- How much better/worse is Tim Thomas than the other goalies?
- Find the difference between Tim Thomas’ goals against average and the other goalies.
- Compare Tim Thomas’ save percentage with the other goalies.
- How much better/worse is Tim Thomas than the other goalies?
- Find the difference between Tim Thomas’ save percentage and the other goalies.
- Find the total of all the goalies goals against average and save percentage.

Accommodations:

Adaptations (For Students with Learning Disabilities)
- Work in groups of 3 or 4 instead of individually.

Extensions (For Gifted Students)
- Have students find the mean of the goalies goals against average and save percentage.
Check for Understanding
• Monitor and observe as students are working.

Closure/Wrap-Up
• Discuss the information students found.
• Who do they think is the best goalie out of the samples they have?

Evaluation
• Check for understanding during discussions and individual work.

Additional Teacher Background
• Teachers should be familiar with what the goals against average and save percentage are.
• An explanation of goals against average can be found at Wikipedia.com
• An explanation of save % from Wikipedia.com
Diagram of a Hockey Rink
Ice Rink Angles – Worksheet

A

B

C

D
Ice Rink Angles – Worksheet Answer Key
Goalie Trading Cards

Martin Brodeur
New Jersey Devils
Goals Against Average – 2.39
Save % - .929

Semyon Varlamov
Washington Capitals
Goals Against Average – 2.37
Save % - .918

Tim Thomas
Boston Bruins
Goals Against Average – 1.85
Save % - .935
Chris Osgood
Detroit RedWings
Goals Against Average – 2.01
Save % - .926

Jonas Hiller
Anaheim Ducks
Goals Against Average – 2.23
Save % - .943

Roberto Luongo
Vancouver Canucks
Goals Against Average – 2.34
Save % - .920