

Name: _____

Skating in the Zone

GRADES 3-5

Explore

Measure the Neutral Zone and Defensive/Offensive zone; do not include the area behind the goal line.

Zones	Length (feet)	Width (feet)
Defensive/Offensive Zone		
Neutral Zone		

Elaborate

Record the time it took to skate around each zone. Then use your dimensions from *Explore* to calculate the total time, distance, and area skated.

Neutral Zone	Time	How far did you skate? (perimeter)	How much area of the ice did you cover? (area)
Attempt 1			
Attempt 2			
Attempt 3			
Total			

Name: _____

Skating in the Zone

GRADES 3-5

Evaluate

Record the time it took to skate around each zone. Then use your dimensions from *Explore* to calculate the total time, distance, and area skated.

Defensive/ Offensive Zone	Time	How far did you skate? (perimeter)	How much area of the ice did you cover? (area)
Attempt 1			
Attempt 2			
Attempt 3			
Total			

Use your totals from both zones to calculate the total time, distance, and area skated.

Zones	Time	How far did you skate? (perimeter)	How much area of the ice did you cover? (area)
Neutral Zone Total			
Defensive/ Offensive Zone Total			
Total			

Name: _____

Skating in the Zone

GRADES 3-5

Extend

As a group, calculate your total time, distance, and area skated.

Both Zones	Time	How far did you skate? (perimeter)	How much area of the ice did you cover? (area)
Student 1 Total			
Student 2 Total			
Student 3 Total			
Student 4 Total			
Team Total			

Name: _____

Playing on Ice

GRADES 3-5

Elaborate

Create a diagram that demonstrates the change from a liquid to a solid. Use lines, arrows, boxes, and circles to clearly describe this change.

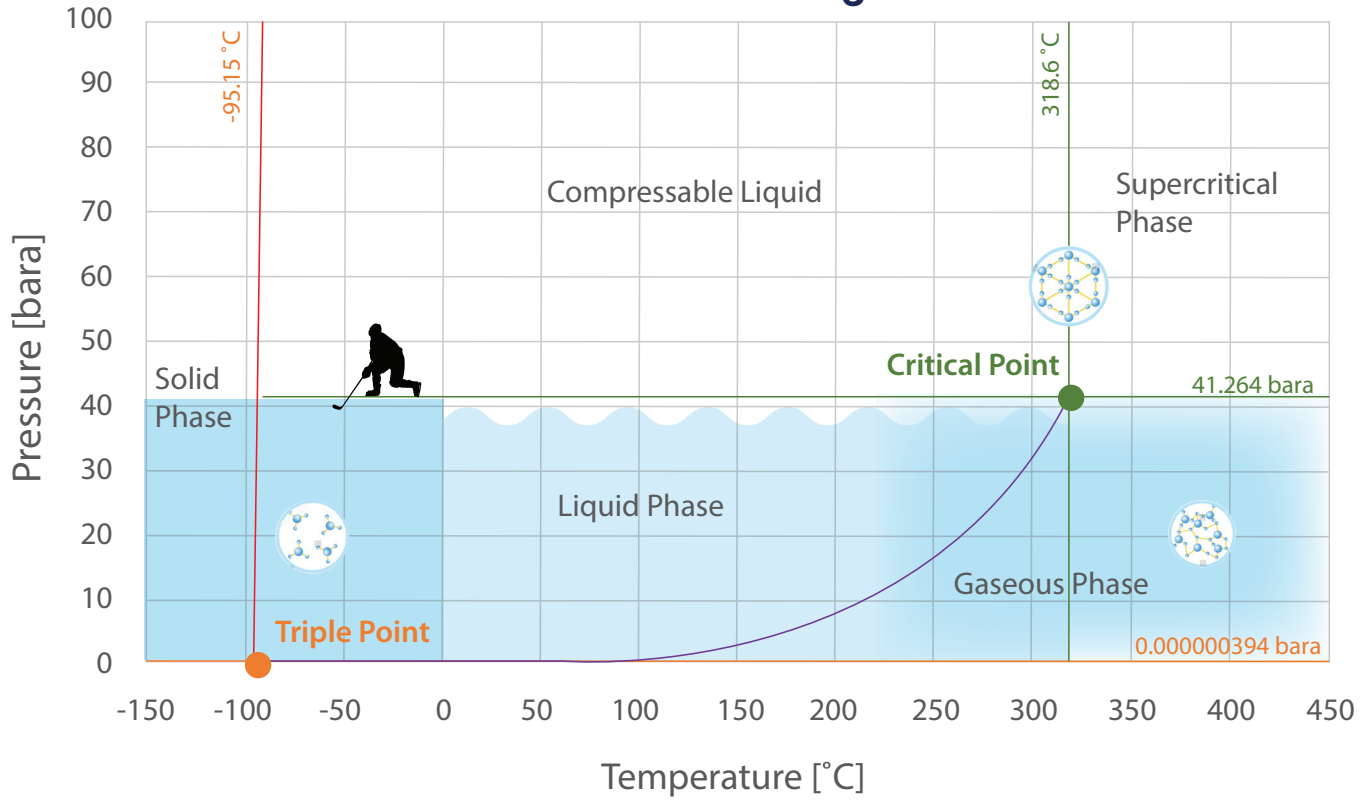


Name: _____

Playing on Ice

GRADES 3-5

Toluene Phase Diagram



Name: _____

Playing on Ice

GRADES 3-5

Evaluate

Fill in the blanks to determine the best playing surface for ice hockey.

1. When water reaches its freezing point, molecules form a definitive structure known as a _____ structure. (Molecular or Proton)
2. The temperature to play ice hockey must be at least: _____ °C / _____ °F
3. Before changing to ice, it is this state of matter _____. (Solid or Liquid)
4. To play on the ice, it must be in this state of matter _____. (Liquid or Solid)
5. Based on the images from the *Explore* section, as well as your diagram that demonstrates the change from a liquid to a solid, why do you think this reaction occurs on ice? Please explain your answer.

Name: _____

Energy in Lacrosse

GRADES 3-5

Explore

Trial 1: Kneeling Position

Distance: _____

	Pass 1	Pass 2	Pass 3	Pass 4	Pass 5
Partner 1					
Partner 2					

Trial 1: Speed Calculations (Distance/Time)

	Pass 1 Speed	Pass 2 Speed	Pass 3 Speed	Pass 4 Speed	Pass 5 Speed
Partner 1					
Partner 2					

Name: _____

Energy in Lacrosse

GRADES 3-5

Elaborate/Evaluate

Trial 2: Standing Position: Focusing on using your lower and upper body to pass and release.

	Pass 1	Pass 2	Pass 3	Pass 4	Pass 5
Partner 1					
Partner 2					

Trial 2: Speed Calculations (Distance/Time)

	Pass 1 Speed	Pass 2 Speed	Pass 3 Speed	Pass 4 Speed	Pass 5 Speed
Partner 1					
Partner 2					

Which trial generated the most energy? Please explain using scientific reasoning from each trial.

Name: _____

Wearable Technology

GRADES 3-5

Elaborate

Criteria	Constraints
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Name: _____

Wearable Technology

GRADES 3-5

Evaluate

Visual	Use of Energy/Resources	Meets Criteria	Avoids Constraint
Video Camera	Potential energy to electrical energy		
Clip Board	No energy transfer		
Helmet Camera	Potential energy to electrical energy		
Speaker	Potential energy to sound energy		
GPS Tracker	Potential energy to electrical energy		
Smartwatch	Potential energy to light energy		

I'd Love to Keep Score!

Like other sports, the game of tennis has its own special way of scoring the game. Before a winner can be determined, three phases of the game must be played: a game, a set, and a match.

A **game** is played until a player can win by reaching 4 points. A point can be earned one of five ways.

- A player can not hit a ball, and the ball bounces twice.
- A **double fault** occurs where the server misses two back to back serves.
- An **Ace** occurs where the player's serve is unable to be returned.
- A ball is hit out of bounds.
- A ball is hit into the net.

Scoring in tennis is unlike any other sport. The first points are actually 15, 30, 40, and then the game winning point.

You might think the game of tennis would be scored as 0 points, 1 point, 2 points, 3 points, and 4 points. However, scoring in tennis is unlike any other sport. The first points are actually 15, 30, 40, and then the game winning point. There are many thoughts as to why tennis is scored this way, but one of the most popular ones is that the game of tennis, which dates back to 12th century France, was originally kept on the face of a clock. The hands of the clock would be moved from 0 minutes to 15 minutes, 30 minutes, 45 minutes, and 60 minutes to keep score.

When announcing the score in tennis point zero is called love. There are also many thoughts of why the score of zero is referred to as "love", the most popular one is that it comes from the French word "l'oeuf" which means "egg". A "l'oeuf" resembles the number zero, which is why "love" is used in the game today. Point one is then called 15, point two is called 30, point three is called 40, and point four is called the game-winning point.

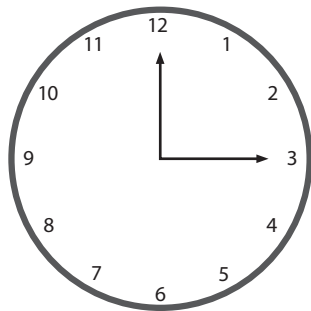


You might be wondering why point 3 is called 40 and not 45... Because if both players make it to point 3 or 40, the score is called "deuce". In order to win, the player must win the next two points in a row. If a player can do this, the next two points would be called "advantage", then the game-winning point. If a player wins the first point, but loses the second point, the points would be called "advantage", then back to deuce. The 40-minute mark is used to represent point 3 in the event of a deuce, letting the

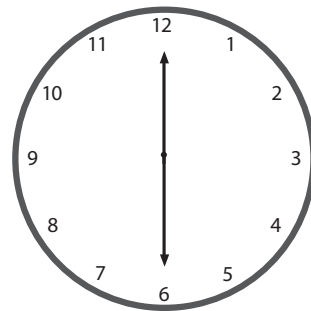
45-minute mark be used to represent the player who has the advantage in the match.

When a player reaches the fourth point, the game is over. The player must win 6 games in order to win the set. Likewise, the player must win by two points to win the set and they must win by two games to win the match. So if a game is at 6-5, a seventh game would have to be played to determine the set winner.

When a player reaches 2 sets won, the match is over!

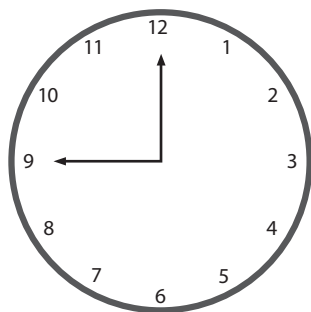


Player A

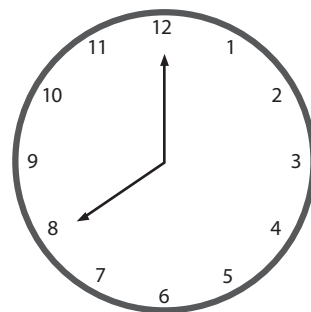


Player B

This model shows an example of Player A having 15 points and Player B having 30 points



Player A



Player B

This model shows an example of a deuce, where Player A has the advantage

	Set 1	Set 2	Set 3	Match Winner
Player A	6	5	6	Player A
Player B	4	7	3	

Name: _____

I'd Love To Keep Score

GRADES 3-5

Explain

Answer the following in the form of a fraction.

1. If a player scores 0 points, draw a fraction model to represent the number of points needed to win the set.

2. If a player scores 1 point, draw a fraction model to represent the number of points needed to win the set.

3. If a player scores 2 points, draw a fraction model to represent the number of points needed to win the set.

4. If a clock reads 12:45, draw a fraction model to represent the number of minutes needed to read 1:00.

5. If a player scores 4 points, draw a fraction model to represent the number of points needed to win the set.

Name: _____

I'd Love To Keep Score

GRADES 3-5

Explain

Answer the following in the form of a fraction.

1. If a clock reads 12:15, draw a fraction model to represent the number of minutes needed to read 1:00.

2. If a clock reads 12:30, draw a fraction model to represent the number of minutes needed to read 1:00.

3. If a clock reads 12:40, draw a fraction model to represent the number of minutes needed to read 1:00.

4. If a clock reads 12:45, draw a fraction model to represent the number of minutes needed to read 1:00.

Name: _____

I'd Love To Keep Score

GRADES 3-5

Evaluate

Use greater than, less than, or equal to symbols ($>$ $<$ $=$) to answer the following.

1. Tennis Point 1 _____ Clock 12:15

2. Tennis Point 2 _____ Clock 12:30

3. Tennis Point 3 _____ Clock 12:45

4. Why do you think the third tennis point is said to be 40 instead of 45?

5. Based on this pattern, what do you think is the final point in a tennis set?

Name: _____

May the Force Be With You!

GRADES 3-5

Explore

	Fastest (1) to slowest (4)	Observations
Overhand Serve		
Forehand Hit		
Backhand Hit		
Student Idea: _____		

Elaborate

	Trial 1		Trial 2		Trial 3	
	Speed	Distance	Speed	Distance	Speed	Distance
Overhand Serve						
Forehand Hit						
Backhand Hit						
Student Idea: _____						

Name: _____

May the Force Be With You!

GRADES 3-5

Evaluate

Use the below space to create your Force Diagrams.

How does a larger unbalanced force change motion? Answer using evidence from your experiment.

Name: _____

Let's Serve

GRADES 3-5

Elaborate

	First Serve		Second Serve (only needed if first serve is not inbounds)	
Serve Number	Speed	Result In – Out – Let	Speed	Result In – Out – Let
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Name: _____

Let's Serve

GRADES 3-5

Evaluate

1. Express the number of times you hit your first serve inbound as a fraction and decimal.

2. Based on the fraction above, write a fraction to represent 100 total serves.

3. Express the number of times you hit your second serve inbound as a fraction and decimal.

4. Based on the fraction above, write a fraction to represent 100 total serves.

5. How do your fractions from your first serve and second serve compare?

6. How does the speed from your first serve and second serve compare?

Name: _____

Advancements in Tennis

GRADES 3-5

Explore

X = In O = Out								
	Hit 1	Hit 2	Hit 3	Hit 4	Hit 5	Hit 6	Hit 7	Hit 8
Line Judge 1								
Line Judge 2								
Video Judge								

Explain/Elaborate

Criteria	Constraints
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

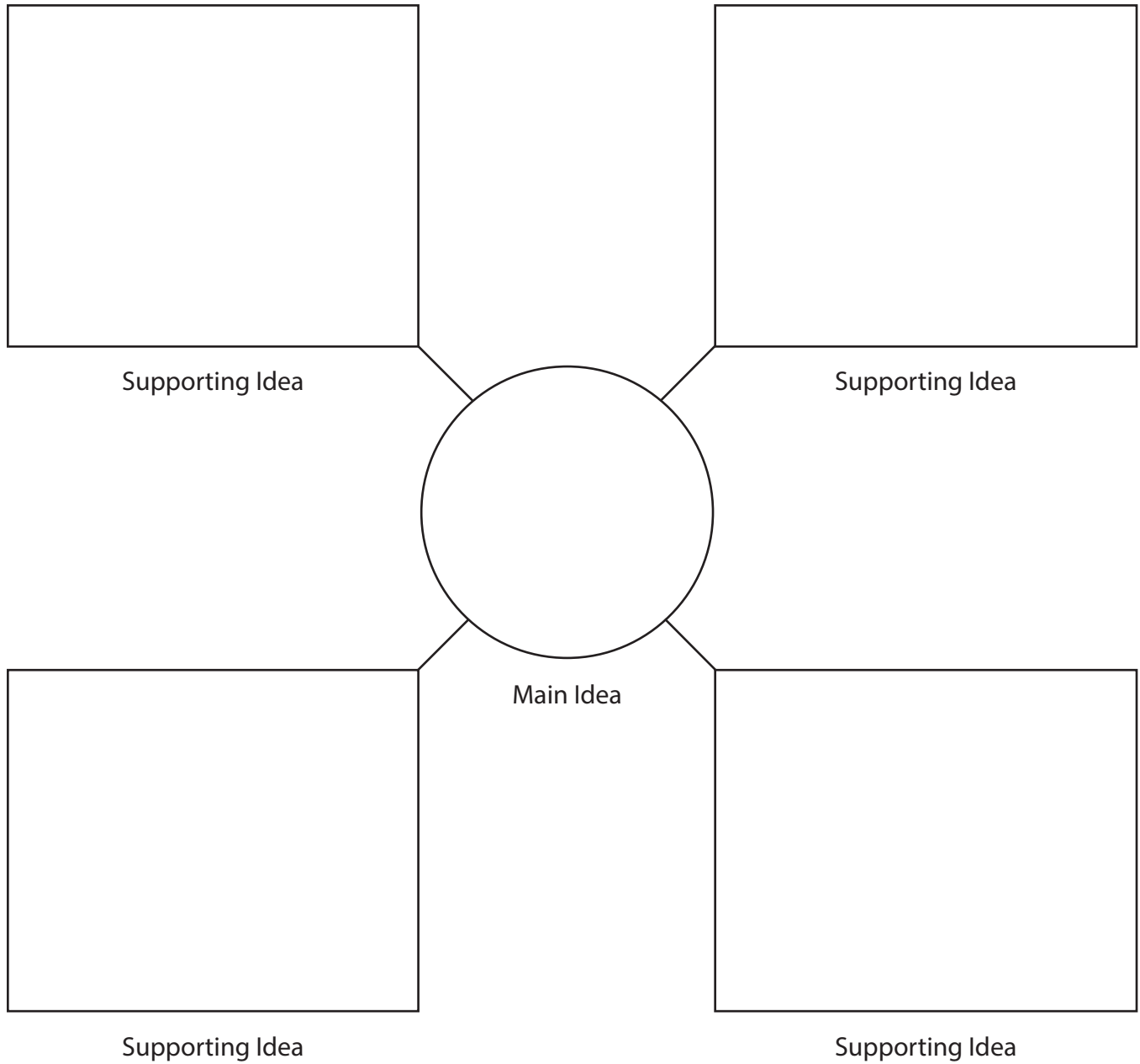
Name: _____

Advancements in Tennis

GRADES 3-5

Evaluate

Use the below graphic organizer to create an outline of your letter to the USTA (United States Tennis Association).



Name: _____

Advancements in Tennis

GRADES 3-5

Evaluate

Have students write a letter to the USTA (United States Tennis Association). The letter should take a stance for supporting or opposing the use of instant replay in tennis. The letter should include specific changes and improvements to benefit all stakeholders involved: players, officials, and spectators.
