Triboelectric boogaloo

A: Intro:

Open the link below: ***WRITE ANSWERS IN TEXT BOX PROVIDED***
https://www.physicsclassroom.com/class/estatics/Lesson-2/Charging-by-Friction
Read through the charging by friction (also known as triboelectric charging)-

1. Summarize the triboelectric charging

2. - If an object is higher on the chart is **(giving/taking)** (highlight one) electrons
   -If an object is lower on the chart is (**giving/taking)** (highlight one) electrons
   -If an object has an affinity for electrons that means it(**giving/taking)** (highlight one) electrons?
3. -what is the law of conservation of charge

4. Try the 4 questions at the bottom of the page and check your answers
   Write answers here:

1	2	3	4

PART B

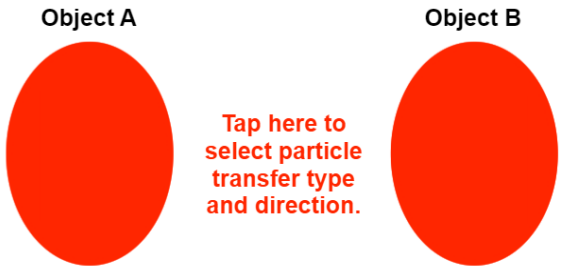
Click on the link below. **There are three parts in the Concept builder**.
https://www.physicsclassroom.com/Concept-Builders/Static-Electricity/Triboelectric-Charging/Concept-Builder

Part one: What's the charge- - use the link above

Use the 3 diagrams to answer the 4 corresponding question

Question 1:

It is known that **Object B** has a weaker affinity (love) for electrons than **Object A**. When the two objects are rubbed together, they become charged. What is the charge on **Object A** and **Object B**? And how do the two objects become charged?



Highlight the correct choice

A becomes POSITIVE NEGATIVE

B becomes POSITIVE NEGATIVE

Electrons transfer from A TO B or B TO A

Question 2:

It is known that **Object D** has a greater affinity (love) for electrons than **Object C**. When the two objects are rubbed together, they become charged. What is the charge on **Object C** and **Object D**? And how do the two objects become charged?

Highlight the correct choice

C becomes POSITIVE NEGATIVE

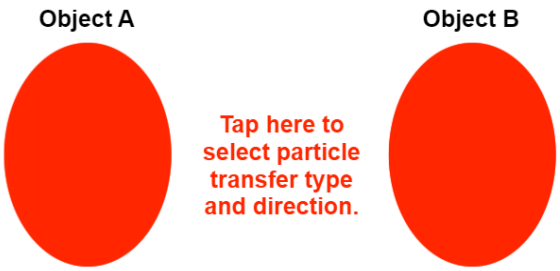
D becomes POSITIVE NEGATIVE

Electrons transfer from C TO D or D TO C

Question 3:

It is known that **Object B** has a greater affinity (love) for electrons than **Object A**. When the two objects are rubbed together, they become charged. What is the charge on **Object A** and **Object B**? And how do the two objects become charged?

Highlight the correct choice



A becomes POSITIVE NEGATIVE

B becomes POSITIVE NEGATIVE

Electrons transfer from A TO B or B TO A

Part 2: Triboelectric series click to open

Open the second activity and record your answers to 1-4

Teflon
Vinyl
Polyethylene
Polyester
Acrylic
Natural Rubber
Wood
Cotton
Paper
Aluminum
Silk
Wool
Glass
Acetate
Rabbit Fur

1.

Material A is rubbed with **Paper**. As a result, Material A becomes charged negatively. Material A is then rubbed with **Acetate**. Once more it becomes charged negatively. Where should Material A be placed on the Triboelectric Series?

HIGHLIGHT THE CORECT CHOICE

a. ABOVE PAPER
b. SOMEWHERE BETWEEN PAPER AND ACETATE
c. BELOW ACETATE

2.

Material A is rubbed with **Polyethylene**. As a result, Material A becomes charged postively. Material A is then rubbed with **Aluminum**. Material A becomes charged negatively. Where should Material A be placed on the Triboelectric Series?

HIGHLIGHT THE CORECT CHOICE

A. ABOVE POLYETHYLENE
B. SOMEWHERE BETWEEN POLYETHYLENE AND ALUMINUM
C. BELOW ALUMINUM

Material A is rubbed with **Polyester**. As a result, Material A becomes charged postively. Material A is then rubbed with A**luminum**. Once more it becomes charged postively. Where should Material A be placed on the Triboelectric Series?

HIGHLIGHT THE CORECT CHOICE

D. ABOVE POLYESTER
E. SOMEWHERE BETWEEN POLYESTER AND ALUMINUM
F. BELOW ALUMINUM

4.

Material A is rubbed with **Acrylic**. As a result, Material A becomes charged postively. Material A is then rubbed with **Silk**. Material A becomes charged negatively. Where should Material A be placed on the Triboelectric Series?

HIGHLIGHT THE CORECT CHOICE

G. ABOVE ACRYLIC
H. SOMEWHERE BETWEEN ACRYLIC AND SILK
I. BELOW SILK

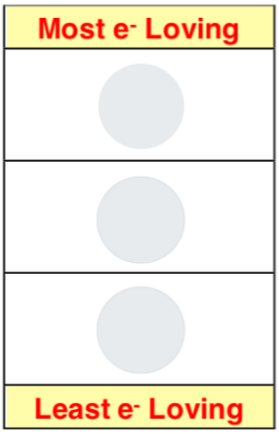
Part 3: Rank the materials

https://www.physicsclassroom.com/Concept-Builders/Static-Electricity/Triboelectric-Charging/Concept-Builder

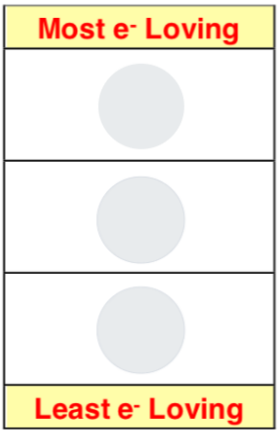
Use the problems below and place your answers in the table accordingly.

Tests are performed with objects made of Materials A, B, and C. The table shows the results. Use these results to create a triboelectric series for A, B, and C.

1.

problem	Sample from website	Write your answers here
<table><tr><th>Test</th><th>Result</th></tr><tr><td>A and B rubbed together</td><td>A is - B is +</td></tr><tr><td>B and C rubbed together</td><td>B is - C is +</td></tr></table>		

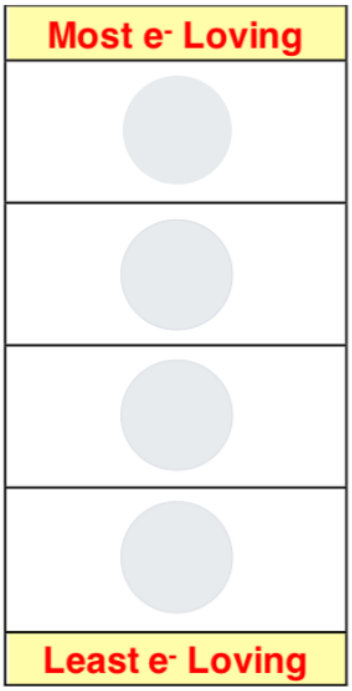
2.

problem	Sample from website	Write your answers here
<table><tr><th>Test</th><th>Result</th></tr><tr><td>A and B rubbed together</td><td>A is + B is -</td></tr><tr><td>B and C rubbed together</td><td>B is - C is +</td></tr><tr><td>A and C rubbed together</td><td>A is + C is -</td></tr></table>		

3.

problem	Sample from website	Write your answers here

Test	Result
A and B rubbed together	A is + B is -
B and C rubbed together	B is - C is +
A and C rubbed together	A is - C is +
C and D rubbed together	C is - D is +



PART 4: Practice

Substances in electrostatic/triboelectric series

Tendency	Substance
High affinity for capturing electrons (tendency to acquire a negative charge)	Plastic
	Copper
	Ebonite (hard rubber)
	Wood
	Cotton
	Paper
	Silk
	Lead
Strong tendency to give up electrons (tendency to acquire a positive charge)	Wool
	Glass

1. What will be the charge on each of the following objects if they are rubbed together?
   Plastic rod and wool cloth

Plastic rod -

Wool Cloth -

2. Glass rod and cotton cloth

Glass rod-

Cotton cloth-

3. Copper rod and silk cloth

Copper rod -

Silk cloth -

4. Paper and plastic ruler

Paper -

Plastic ruler-

5. An ebonite rod charged by rubbing it with silk

ebonite-

silk-

6. A glass rod is charged by rubbing it with wool

glass-

wool-