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Subject Code: STEM07	Subject Title: General Physics 2
Module No: 02	Topic: Electric Fields

II. LET'S BEGIN

A 1. Two unlike charges _____

- a. attract each other
- b. repel each other
- c. neutralize each other
- d. have no effect on each other

D 2. Which of the following is not a process of charging?

- a. Induction
- b. Friction
- c. Conduction
- d. Convection

A 3. Material A is positively charged. When brought near to material B, they attract. Which of the following is true?

- a. Material B is negatively charged
- b. Material B is positively charged
- c. Material B is uncharged
- d. Both are uncharged

B 4. Material B has become positively charged after rubbing it with Material A. Which of the following statements is correct?

- a. Material B loses protons
- b. Material B gains electrons
- c. Material A loses proton
- d. Material A gains electron

C 5. What will happen when two unlike charges are brought together? They will _____

- a. repel each other
- b. neutralize each other
- c. attract each other
- d. no effect each other

IV. WE'RE ON OUR WAY

B 1. The diagram below shows the behavior of the electroscope before and after a positively charged rod is placed near the electroscope knob. This tells us that the movement of electrons is from _____.

a. rod to leaves



- b.leaves to knob
- c.knob to leaves, then back to knob
- d.leaves to knob, then back to leaves

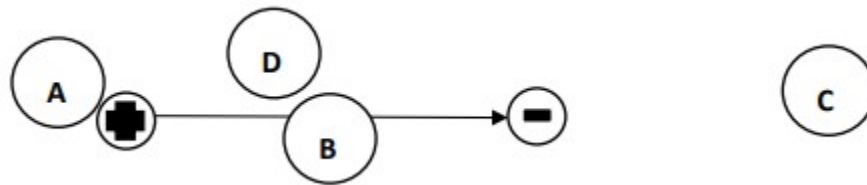
C 2.A glass rod was positively charged when rubbed with a silk cloth. The net positive charge is accumulated because the glass rod

- a.loses protons
- b.loses electrons
- c.gains electrons
- d.loses electrons

A 3.Gravitational forces and electric forces are both

- a.forces with attractive and repulsive behaviors
- b.indirectly proportional to the square root of separation between bodies
- c.directly proportional to the product of the masses and charges
- d.decreasing when the distance between two bodies is decreasing

B 4.At which point is the electric field strength strongest?



C 5.Three spheres were brought together. When Spheres A and B are brought together, they attract. When spheres B and C are brought together, they also repel. Which of the following is true?

- a.Spheres A & C have same signs
- b.Spheres B & C have same signs
- c.Spheres A & C have opposite signs
- d.Spheres A & B have similar signs

A 6.The first object has a charge of $+3\text{ nC}$, and the second object has a charge of 6 nC . Which is true about the electric forces between these objects?

- a. $F_{1\text{ on } 2} = 2F_{2\text{ on } 1}$
- b. $3F_{1\text{ on } 2} = 6F_{2\text{ on } 1}$
- c. $-6F_{1\text{ on } 2} = 2F_{2\text{ on } 1}$
- d. $F_{1\text{ on } 2} = F_{2\text{ on } 1}$



B 7. A positively charged rod was brought near to a metallic plate; what is the type of charge induced along the side facing the rod?

- a.positive

- b.negative
- c.netural
- d.depends on number of charges

C.8.If the positively charged rod was touched on the neutral metallic plate, what is the charge of the plate?

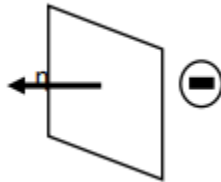
- a.same
- b.negative
- c.positive
- d.depends on number of charges

C.9.After the positively charged rod is placed near the plate, a grounded wire was attached. What is the charge of the plate after the wire is removed?

- a.negative
- b.positive
- c.neutral
- d.depends on number of charges

A 10.The electric flux through the surface at the right is ____

- a.zero
- b.negative
- c.positive
- d.unknown



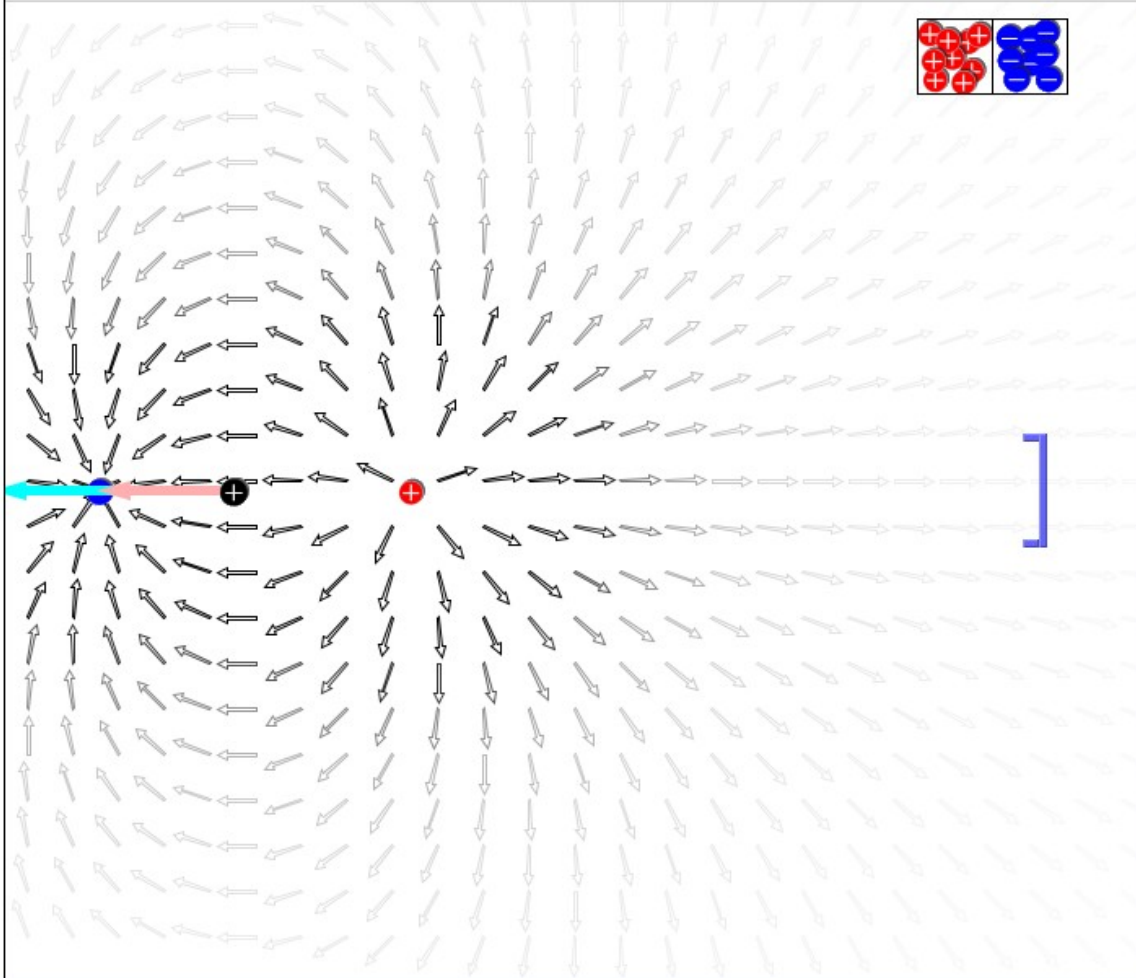
V. HOW FAR HAVE WE GONE

Direction: Click the link and go to this site

<https://phet.colorado.edu/sims/cheerpj/electric-hockey/latest/electrichockey.html?simulation=electric-hockey>. After clicking, kindly place the $-q$ and $+q$ then clicks the trace and field in the simulation then screenshot. Then, click the start and screenshot the figure being form based on the field. Print the two screenshots.

Electric Field Hockey - derived from work by Ruth Chabay (1.10)

File Help



Start

Reset

Tries: 0

☐ Pause

Clear

☒ Puck Is Positive

☒ Trace

☒ Field

☒ Antialias

☒ Practice

Difficulty:

☒ 1

☐ 2

☐ 3

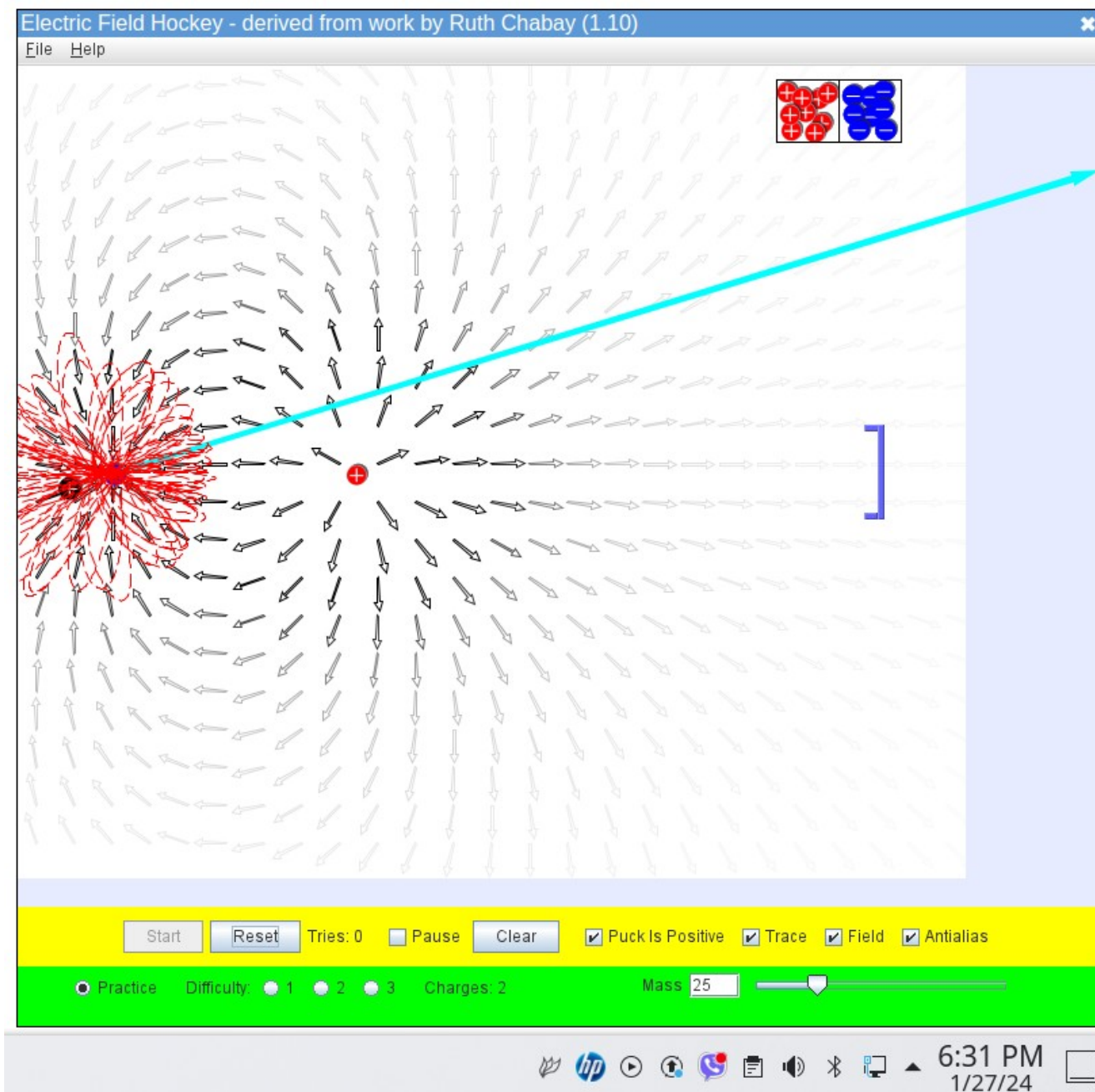
Charges: 2

Mass: 25



6:21 PM
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VI. WALKING THE EXTRA MILE

Direction: Click the link and go to this site

<https://phet.colorado.edu/sims/cheerpj/electric-hockey/latest/electrichockey.html?simulation=electric-hockey>. After clicking, kindly place the $-q$ and $+q$ then clicks the trace and field in the simulation then screenshot. Then, click the start and screenshot the figure being form based on the field. Print the two screenshots.

1. Ask a local weather forecaster/Science teacher/physicist/electrician/engineer through phone calls or interview through Zoom, Google Meet, or Messenger and inquire (with supervision from your parents/guardian/learning facilitator) about lightning, lightning safety, and lightning rods.

2. Conduct simulations on electrostatics, electric fields, Gauss's law using online sources. From this, write a short reflection. Refer to any sites below:

<https://phet.colorado.edu/en/simulation/charges-and-fields>

<https://www.falstad.com/emstatic>

<http://web.mit.edu/viz/soft/visualizations/DLIC/doc/simulations/experiments/electrostatics/package-summary.html>

https://javalab.org/en/category/electricity_en/static_electricity_en/

3. Suppose you are to demonstrate a trick to kids using electrostatic charging. How will you demonstrate the trick? List down the materials (preferably available at home), step-step procedures, and brief explanation of how this trick works

Answers:

PROCEDURES

1. Interview about Lightning:

- Contact: Reach out to a local weather forecaster, science teacher, physicist, electrician, or engineer.
- Topics to Discuss:
 - Lightning phenomena and how it occurs.
 - Lightning safety measures.
 - The role and function of lightning rods in protecting structures.

2. Simulations on Electrostatics:

- Access Simulation Sites:
 - [PhET Simulation](<https://phet.colorado.edu/en/simulation/charges-and-fields>)
 - [Falstad Simulation](<https://www.falstad.com/emstatic>)
 - [MIT Electrostatics Simulation](<http://web.mit.edu/viz/soft/visualizations/DLIC/doc/simulations/experiments/electrostatics/package-summary.html>)
 - [JavaLab Simulation](https://javalab.org/en/category/electricity_en/static_electricity_en/)
- Conduct Simulations:
 - Explore electrostatics, electric fields, and Gauss's law.
 - Take notes on your observations, any patterns you notice, and how the simulations align with theoretical concepts.

3. Electrostatic Trick for Kids:

Materials:

- Balloon
- Small pieces of paper or confetti

Procedure:

1. Rubbing the Balloon:

- Rub the balloon against your hair or a fabric to generate a static charge.

2. Attracting Paper/Confetti:

- Hold the balloon close to a surface where small pieces of paper or confetti are scattered.

3. Observation:

- Observe as the charged balloon attracts the paper or confetti, causing them to stick to the balloon.

4. Explanation:

- This trick demonstrates the principles of static electricity. When the balloon gains a static charge, it creates an electric field that attracts the lightweight paper or confetti.

5. Discussion:

- Explain to the kids how this relates to the everyday phenomenon of static electricity, where objects can become charged through friction, and the charged object can attract or repel other objects.

Remember to emphasize safety during any demonstrations and have adult supervision if needed.