

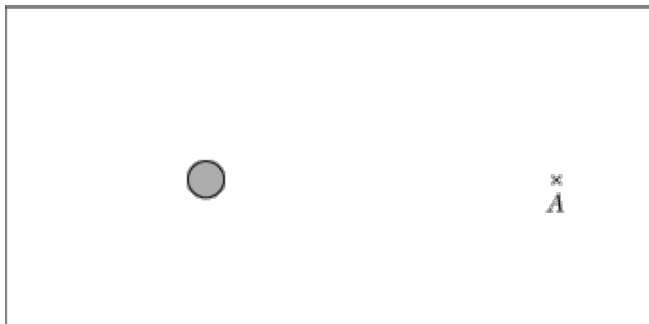
WebAssign
CH15-HW04-FALL2010 (Homework)

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 PHYS 272-FALL 2012, Fall 2012
 Instructor: Virendra Saxena

Current Score : 16 / 16 **Due :** Tuesday, September 11 2012 11:59 PM EDT

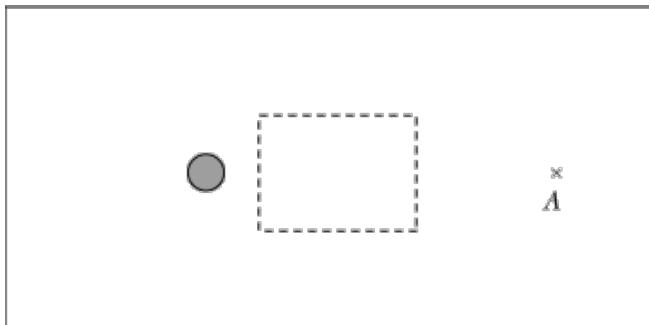
 1. 6/6 points | [Previous Answers](#)

MI3 15.6.P.064

 (a) The **negatively** charged particle shown in the diagram at left creates an electric field \vec{E}_p at location A.

 What is the direction of \vec{E}_p at location A? (Refer to the rosette above.)

 ✓

(b) Now a block of metal is placed in the location shown by the dashed rectangle.


 What is the direction of the electric field \vec{E}_m at location A due only to the charges in and/or on the metal block? (Refer to the rosette above.)

 ✓

(c) With the metal block still in place, what is the direction of the net electric field at location A?

 ✓

 (d) With the metal block still in place, what is the magnitude of \vec{E}_p , the field due only to the charged particle?

- ☐ $|\vec{E}_p|$ is less than it was originally, because the block is in the way.
- ☐ $|\vec{E}_p|$ is zero, because the electric field due to the particle can't go through the block.
- ☒ $|\vec{E}_p|$ is the same as it was originally, without the block.


 (e) With the metal block still in place, how does the magnitude of \vec{E}_{net} at location A compare to the magnitude of \vec{E}_p ?

 $|\vec{E}_{\text{net}}|$ $|\vec{E}_p|$ ✓

 (f) What is the direction of the net electric field *at the center of the metal block* (inside the metal)?

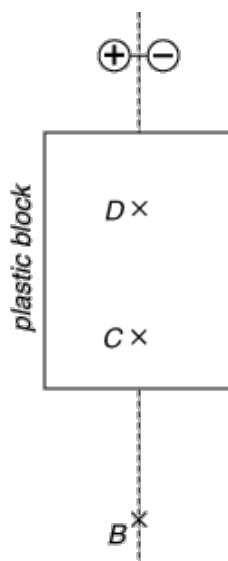
 ✓

- [Read the eBook](#)
- [Section 15.6](#)

2. 10/10 points | [Previous Answers](#)

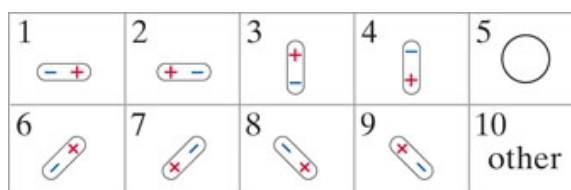
MI3 15.4.P.048

A dipole consisting of two oppositely charged balls connected by a wooden stick is located as shown in the diagram at right. A block of plastic is located nearby, as shown. Locations B , C , and D all lie on a line perpendicular to the axis of the dipole, passing through the midpoint of the dipole.



Before selecting answers to the following questions, draw your own diagram of this situation, showing all the fields and charge distributions requested..

Answer the following questions by selecting either a direction (a-j) or an orientation of a polarized molecule (1-10) from the diagrams below.



Which of the arrows shown above best indicates the direction of the electric field at location C , due only to the dipole? ✓

Which of the arrows shown above best indicates the direction of the electric field at location D , due only to the dipole? ✓

Which of the diagrams shown above best indicates the polarization of a molecule of plastic at location C ?

✓

Which of the diagrams shown above best indicates the polarization of a molecule of plastic at location D ?

✓

Which of the following statements is correct?

- ☒ A molecule located at D would be polarized more than a molecule located at C .
- ☐ A molecule located at D would be polarized less than a molecule located at C .
- ☐ The polarization of a molecule located at D would be the same as the polarization of a molecule located at C .
- ☐ A molecule located at C would be not be polarized at all.



Which of the arrows shown best indicates the direction of the electric field at location B , due only to the dipole?

Which of the arrows shown best indicates the direction of the electric field at location B , due only to the plastic block?

The magnitude of the electric field at B due to the plastic is less than the magnitude of the electric field at B due to the dipole.

Which of the arrows shown best indicates the direction of the net electric field at location B ?

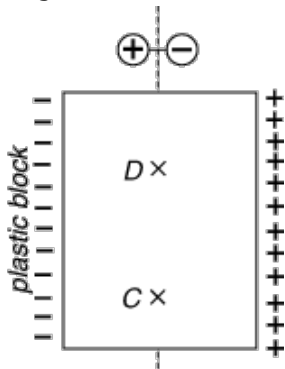


Which of the following statements is correct?

- ☐ The electric field at B due only to the dipole would be smaller if the plastic block were not there.
- ☐ The electric field at B due only to the dipole would be larger if the plastic block were not there.
- ☒ The electric field at B due only to the dipole would be the same if the plastic block were not there.
- ☐ The electric field at B due only to the dipole would be zero if the plastic block were not there.



Using the diagrammatic conventions discussed in the textbook and in class, a student drew the diagram below to help answer the questions asked above. Which of the following statements about the student's diagram are true? Check all that apply.



- ☐ The direction of polarization of the plastic block is wrong.
- ☒ The diagram shows mobile charges; this is wrong because an insulator does not have mobile charged particles.
- ☐ The diagram is correct; this is just a different way of drawing the polarization.



- [Read the eBook](#)

- [Section 15.4](#)