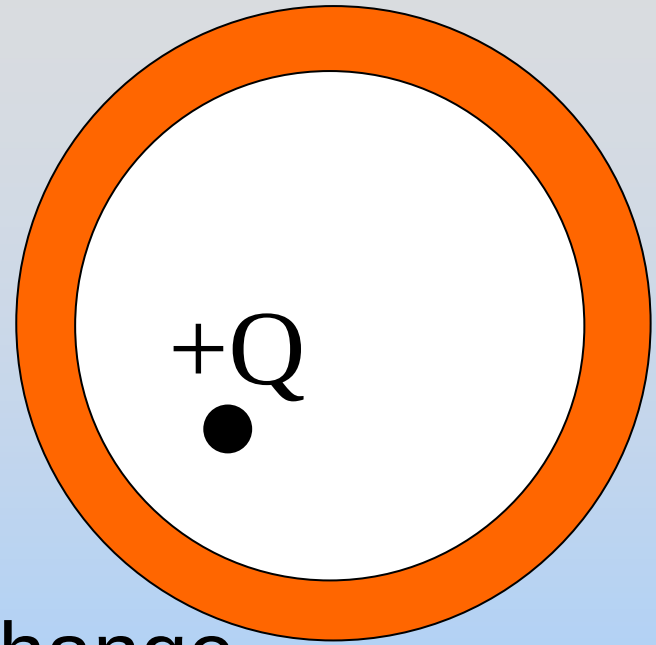
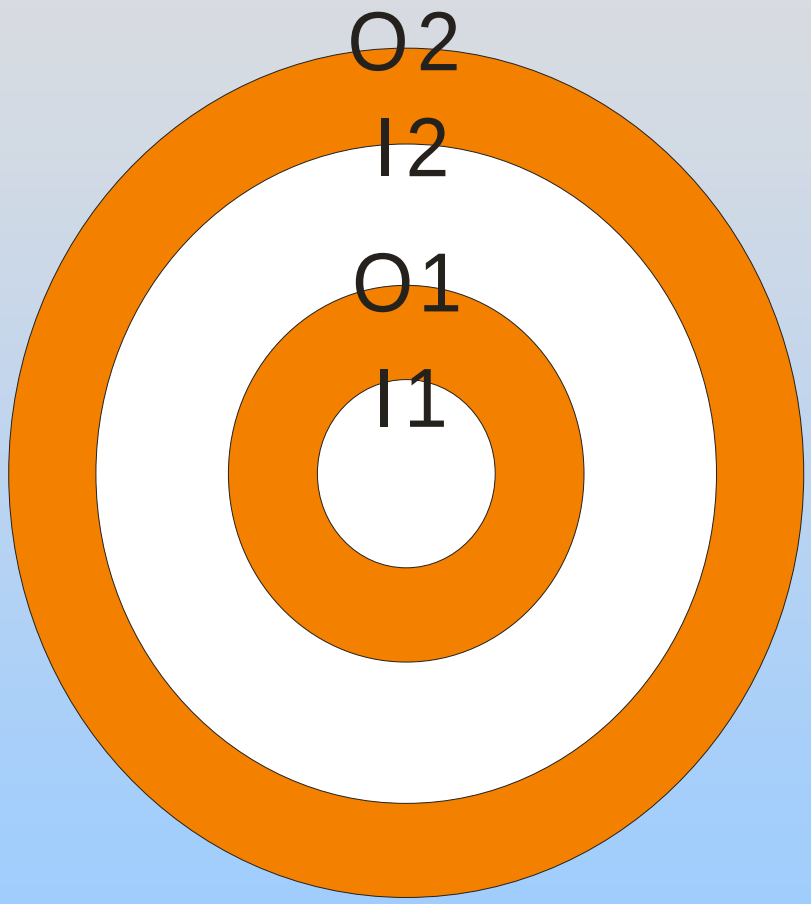
Concept Question: Point Charge in Conductor

A point charge +Q is placed inside a neutral, hollow, spherical conductor. As the charge is moved around *inside*, the electric field ***outside***



1. is zero and does not change
2. is non-zero but does not change
3. is zero when centered but changes
4. is non-zero and changes
5. I don't know

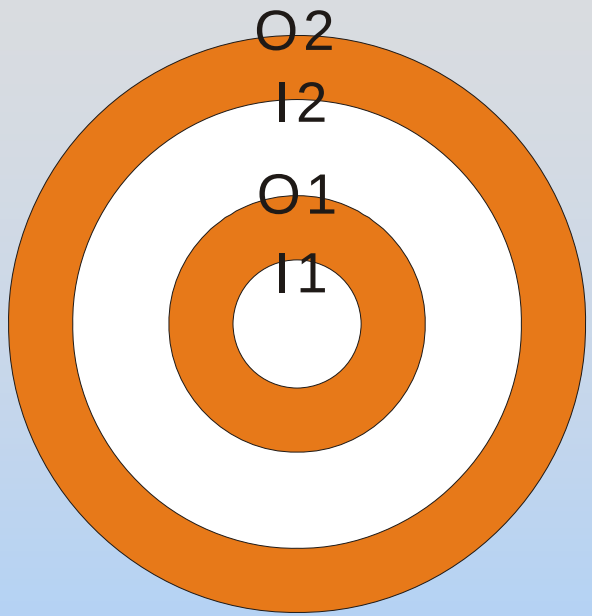
Concept Question Setup



What happens if we put Q in the center of these nested (concentric) spherical conductors?

Concept Question: Hollow Conductors

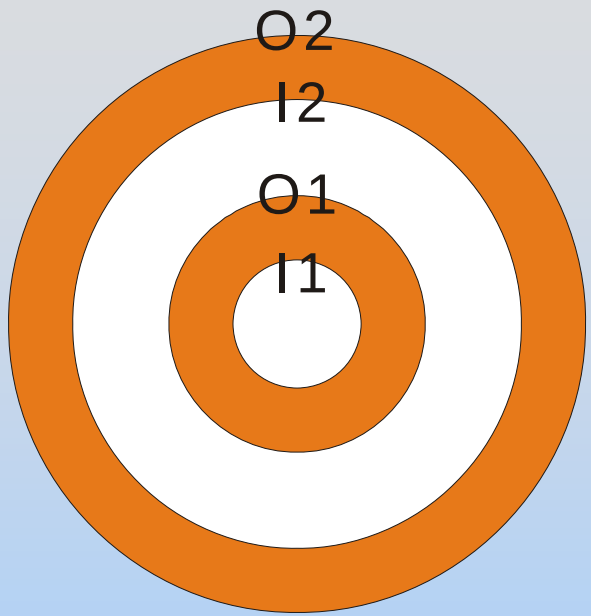
A point charge +Q is placed at the center of the conductors. The induced charges are:



1. Q(I1) = Q(I2) = -Q; Q(O1) = Q(O2)= +Q
2. Q(I1) = Q(I2) = +Q; Q(O1) = Q(O2)= -Q
3. Q(I1) = -Q; Q(O1) = +Q; Q(I2) = Q(O2)= 0
4. Q(I1) = -Q; Q(O2)= +Q; Q(O1) = Q(I2)= 0

Concept Question: Hollow Conductors

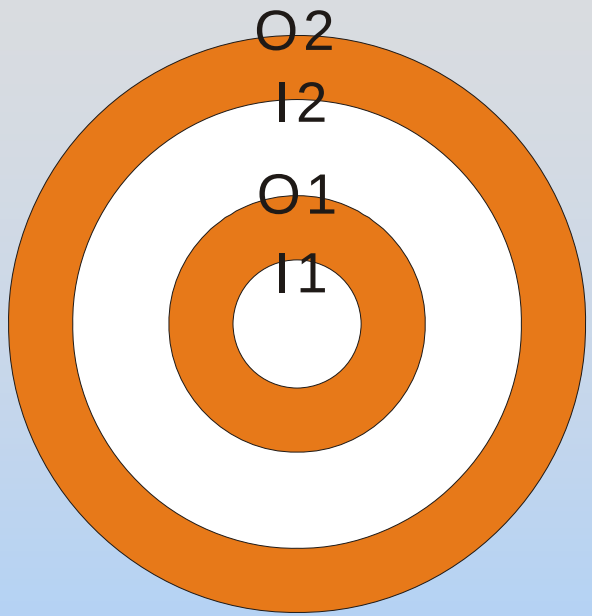
A point charge +Q is placed at the center of the conductors. The potential at O1 is:



1. Higher than at I1
2. Lower than at I1
3. The same as at I1

Concept Question: Hollow Conductors

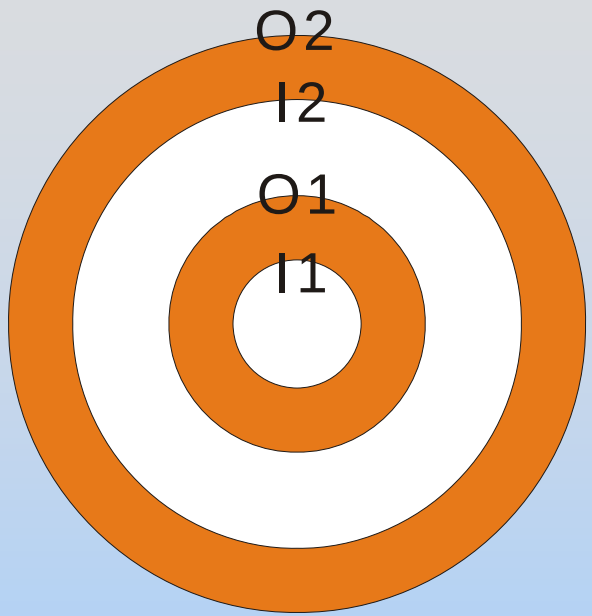
A point charge +Q is placed at the center of the conductors. The potential at O2 is:



1. Higher than at I1
2. Lower than at I1
3. The same as at I1

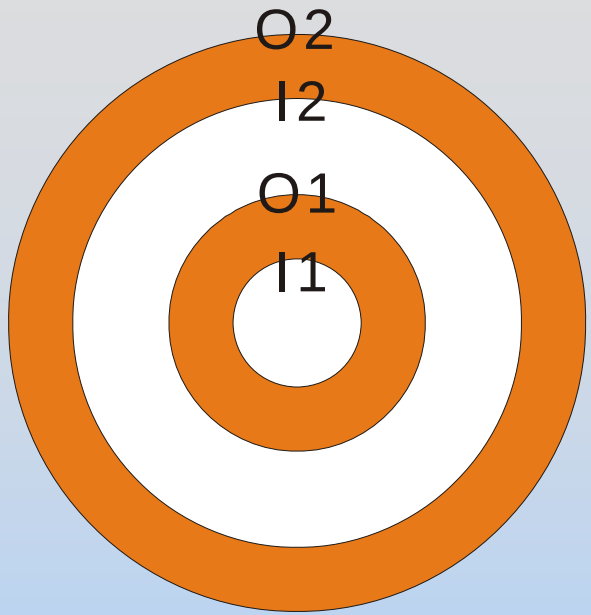
Concept Question: Hollow Conductors

A point charge +Q is placed at the center of the conductors. If a wire is used to connect the two conductors, then current (positive charge) will flow



1. from the inner to the outer conductor
2. from the outer to the inner conductor
3. not at all

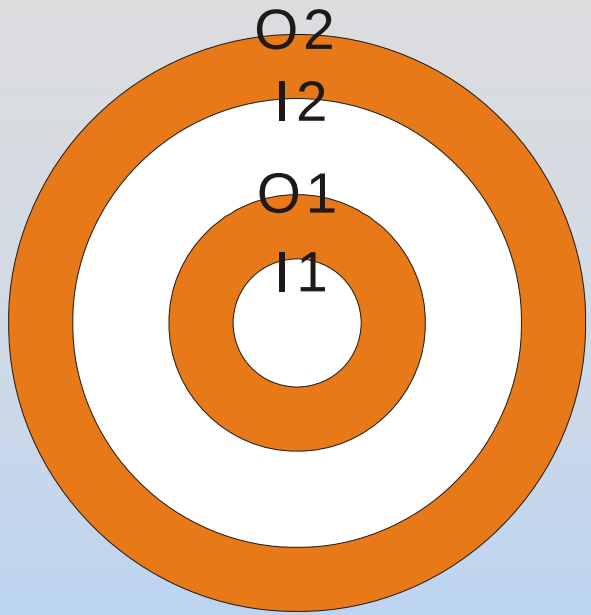
Concept Question: Hollow Conductors



You connect the “charge sensor’s” red lead to the inner conductor and black lead to the outer conductor. What does it actually measure?

1. Charge on I1
2. Charge on O1
3. Charge on I2
4. Charge on O2
5. Charge on O1 – Charge on I2
6. Average charge on inner – ave. on outer
7. Potential difference between outer & inner
8. I don’t know

Concept Q.: Hollow Conductors



You connected the “charge sensor’s” red lead to the inner conductor and black lead to the outer conductor. What does it actually measure?

1. Charge on I1
2. Charge on O1
3. Charge on I2
4. Charge on O2
5. Charge on O1 – Charge on I2
6. Average charge on inner – ave. on outer
7. Potential difference between inner & outer
8. I don’t know

8.02SC Physics II: Electricity and Magnetism

Fall 2010