Name: Date: Class:

KWL Chart and Design Guide Student Samples

ASK: How can we, as materials scientists, model atomic scale designs for hardware for next generation computers?

Use the KWL chart below to work independently or with your team to clarify what you already know about computer technologies, memristors, and the use of computer simulations to design models.

Know	Want to Know	Learned
ions exist atoms = small Lew's dot diagram covalent bonds Polarization add	• are your models accurate • how much energy does it take to run computations • aren't electrons really random	memristers element impurities

RESEARCH: Read the information provided about memristors and computer simulations. Use the space below to record your notes. If you have extra time, you can use reliable internet resources to perform further research and learn more.

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Know	Want to Know	Learned
Capacitors Computer hardware is made of atoms Semiconductors Ions exist Atoms are very very small Lewis dot Diagrams Coulomb's law and polarization	How are they trapping electrons? Are electrons like unpredictable? Where does the data for the computer models come from? How accurate can the models be?	Memristors have memory of what has passed through them Density Functional Theory relies on predicting electrons Different combinations of materials allow electrons to flow in different ways according to atomic impurities

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Know	Want to Know	Learned
-transistors - capacitor - memristor - DFT	(2D TMDs) what softwares do they use what's the different in the production between transistors memristors work	Scientific models and computing how designing memristors actually works

RESEARCH: Read the information provided about memristors and computer simulations. Use the space below to record your notes. If you have extra time, you can use reliable internet resources to perform further research and learn more.