

## Build an Atom Project

Name: \_\_\_\_\_

Partner: \_\_\_\_\_

### Atoms Note (This page was intended for additional support for students that required it)

All matter is made up of atoms. Atoms are made up of protons, neutrons and electrons.

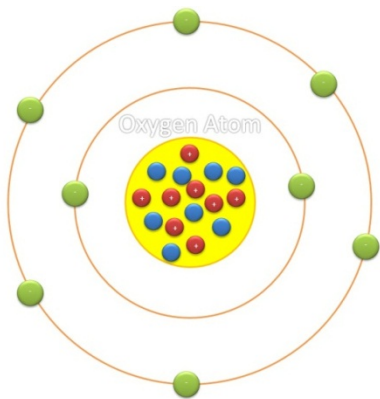
Protons (+)	Neutrons	Electrons (-)
Positive charge Inside nucleus	No charge Inside nucleus	Negative charge Outside nucleus Spins around nucleus

#### **Nucleus**

The nucleus of the atom is the ***inner most part*** where the protons and neutrons are found. Protons are the positive charges in an atom and a neutron has no charge at all. There are usually the same amount of protons inside a nucleus as there are neutrons.

#### **Electrons**

**Electrons** are the negative charge that rotates around the outside of the nucleus on what's called **shells**. Electrons are always evenly spaced on the shells of an atom because they are repelled by one another. The force is so great that they try to stay as far apart from one another as they can. The inner shell of an atom can only contain 2 electrons; the second shell can only contain up to 8 electrons.



Green = **Electrons**

Red = **Protons**

Blue = **Neutrons**

When an atom is **electrically balanced** that means it has the same number of protons and electrons.

References: Take a look at these sites for ideas on how to make an atom.

<http://www.squidoo.com/how-to-build-a-balanced-atom-science-project-instructions-and-pictures>

<http://mrwilliams6thgradescience.blogspot.com/2009/05/model-of-atom-project.html>

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### Build an Atom Project Grade 6 Science Project

#### **Project Overview**

Your challenge is to pick an atom in the periodic table. Be easy on yourself. I suggest choosing an atom with an atomic number between 1 and 8. You will research the atom, answer some questions and do brainstorming, make a proper 3D model of the atom and finally write a report on your project.

Relax! We have already learned everything we need to know. This is a chance for you to show me what you know and be creative! Doing this will help you on your test!

#### **Steps**

- 1) Setup → Find a partner, make sure you have this lesson sheet, your atom project worksheet, pen and paper, and the marking rubric.
- 2) Decide on an atom → Pick your atom. (It will be much easier if you choose an atom between atomic numbers 1-6, but if you want a challenge you may choose any atom.)
- 3) Research your atom → Look in a periodic table, research your element and answer the questions “Before you begin” on the atom project worksheet.
- 4) Brainstorm → Plan your model for your atom. What supplies are you going to use? Make a diagram of your atom on the “Build an atom project worksheet” under the “Brainstorm your atom model” section.

Some ideas to get you started: Here are some ideas for what to use for your model.

Feel free to use these ideas or find your own. Think about how you will show that the protons, neutrons and electrons are different. Ping-pong balls, gum drops, marshmallows, rubber balls, beads, ball bearings, golf balls and styrofoam balls have all been used in the past. Basically, anything that is roundish and that can be glued to each other should work. It is helpful if the balls are color coded so that it is easier to tell which balls are protons, which are neutrons and which are electrons. It is also helpful if the electrons are smaller than the protons and neutrons

- 5) Plan → Make a list of the supplies that you may need. Add these to your “Build an atom project worksheet” under the “Plan your materials” section.
- 6) Make Your Model → Working with your partner, build your 3D model.
- 7) Report → Write a report about your atom. Include a title page with your name, date, my name, science 6, and the title of the project. On the report include a list with the atoms name, atomic number, atomic mass, number of protons, neutrons and electrons. Include a picture of the atom with the neutrons, protons and electrons drawn on them. In the drawing be sure to put the electrons in the right energy levels. Explain the chemical and physical properties of your element and some of its uses.

Best of Luck! Have Fun! ☺

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### Atom Project Worksheet

#### Before You Begin

**Instructions:** With your partner please decide on an atom and research it.

\*Note: Remember what we have learned about plagiarism. Make sure your written answers are in YOUR OWN WORDS. It cannot be copied from your partner.

Atom's Name: \_\_\_\_\_

Atomic Number: \_\_\_\_\_

Atomic Symbol: \_\_\_\_\_

# of Protons: \_\_\_\_\_

# of Neutrons: \_\_\_\_\_

# of Electrons: \_\_\_\_\_

How do you determine the number of Protons and Neutrons and electrons in an atom? \_\_\_\_\_

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How many electrons are in your atom? \_\_\_\_\_

What are electron levels? \_\_\_\_\_

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Which electron energy level are your atoms electrons in? (Extension: Try to include the names of each of these energy levels) \_\_\_\_\_

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### Build an Atom Project

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Draw an Atomic Model diagram for your atom.

### Brainstorm your atom model

**Instructions:** With your partner please brainstorm how you will make a 3D model of an atom. Draw the model here. Please label the protons, neutrons and electrons and all the materials that you will be using for your model.

\*Note: You are to do this with your partner, you are working together so your brainstorming should be the same.

Name: \_\_\_\_\_

Now it's time to start your model! Have Fun!

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- Used the “Build an Atom: Atoms Note”
- Completed 1, 2, or 3 extensions.
- Added their own additional information
- Completed all extensions thoroughly

Preparation and Work Habits				
Preparedness	1- Not prepared	2- Slightly prepared	3 - Mostly prepared	4- Very prepared
Follows instructions	1- Does not follow instructions	2 - Somewhat follows instructions	3 - Mostly follows instructions	4 - Completely follows instructions
Working with a partner	1 - Does not work well with a partner	2 - Works somewhat successfully with a partner	3 - Works mostly successfully with a partner	4 - Works completely successfully with a partner
Brainstorming and research Phase				
Planning Questions	2- Does not complete planning questions correctly	4 – Somewhat completes questions correctly (60-70%)	6 – Mostly completes questions correctly (70-99%)	8 – Completes all planning questions correctly (100%)
Brainstorming the model	1 – Does not complete brainstorming	2- Brainstorms with little thought and detail	3 – Brainstorms the model thoroughly and with detail	4 – Has complete detail and show significant thought in brainstorming.
Finished Product				
Creativity and visual appeal of model	2 – model is not creative or visually appealing	4 – Model is somewhat creative and visually appealing	6 – Model is very creative and visually appealing.	8 – Model is extremely creative and visually appealing.
Accuracy of atom	2 – model is not an accurate representation of atom.	4 – Model is somewhat an accurate representation of atom.	6 – Model is an accurate representation of atom.	8 – Model is completely an accurate representation of atom including having electrons in right places.
Report				
Includes all necessary components (title page, report with all sections included, 3 pages atom project worksheet)	1 – Report is not complete.	2 – Report may have 1 incomplete section.	3 – Report is complete	
Neatness, layout	1 – Report is not neat or well laid out.	2 – Report is somewhat neat and well laid out.	3 – Report is neat and well laid out.	4 – Report is very neat and well laid out.
Atomic information (name, atomic number, atomic mass, numbers of protons, neutrons and electrons)	2 - Does not have accurate atomic information.	4 - Has somewhat accurate atomic information (60-70%)	6 - Has mostly accurate atomic information (70-99%)	8 - Has completely accurate atomic information (100%)
Accurate picture or hand drawn diagram of atom (includes: neutrons, protons and electrons)	2 - Does not have an accurate picture of their atom	4 - Has a somewhat accurate picture of their atom.	6 - Has a mostly accurate picture of their atom.	8 - Has a very accurate picture of their atom.
Explain chemical properties of element	2 - Does not accurately describe the chemical properties of the element.	4 - Somewhat accurately describes the chemical properties of the element.	6 - Accurately describes the chemical properties of the element.	8 - Explains the chemical properties of the element completely and with detail.
Explain physical properties of element	2 - Does not accurately describe the physical properties of the element.	4 - Somewhat accurately describes to physical properties of the element.	6 - Accurately describes the physical properties of the element.	8 - Explains the physical properties of the element completely and with detail.