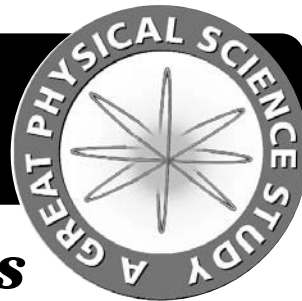


Great Science Adventures



Lots of Science Library Books

Each *Lots of Science Library Book* is made up of 16 inside pages, plus a front and back cover. All the covers to the *Lots of Science Library Books* are located at the front of this section. The covers are followed by the inside pages of the books.

How to Photocopy the *Lots of Science Library Books*

As part of their *Great Science Adventure*, your students will create *Lots of Science Library Books*. The *Lots of Science Library Books* are provided as consumable pages which may be cut out of the *Great Science Adventures* book at the line on the top of each page. If, however, you wish to make photocopies for your students, you can do so by following the instructions below.

To photocopy the inside pages of the *Lots of Science Library Books*:

1. Note that there is a "Star" above the line at the top of each *LSLB* sheet.
2. Locate the *LSLB* sheet that has a Star on it above page 16. Position this sheet on the glass of your photocopier so the side of the sheet which contains page 16 is facing down, and the Star above page 16 is in the left corner closest to you. Photocopy the page.
3. Turn the *LSLB* sheet over so that the side of the *LSLB* sheet containing page 6 is now face down. Position the sheet so the Star above page 6 is again in the left corner closest to you.
4. Insert the previously photocopied paper into the copier again, inserting it face down, with the Star at the end of the sheet that enters the copier last. Photocopy the page.
5. Repeat steps 1 through 4, above, for each *LSLB* sheet.

To photocopy the covers of the *Lots of Science Library Books*:

1. Insert "Cover Sheet A" in the photocopier with a Star positioned in the left corner closest to you, facing down. Photocopy the page.
2. Turn "Cover Sheet A" over so that the side you just photocopied is now facing you. Position the sheet so the Star is again in the left corner closest to you, facing down.
3. Insert the previously photocopied paper into the copier again, inserting it face down, with the Star entering the copier last. Photocopy the page.
4. Repeat steps 1 through 3, above, for "Cover Sheets" B, C, D, E, and F.

Note: The owner of this book has permission to photocopy the *Lots of Science Library Book* pages and covers for classroom use only.

How to assemble the *Lots of Science Library Books*

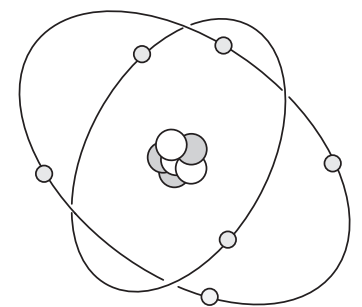
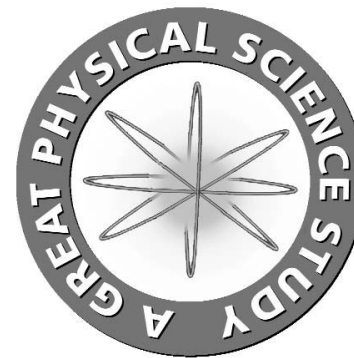
Once you have made the photocopies or cut the consumable pages out of this book, you are ready to assemble your *Lots of Science Library Books*. To do so, follow these instructions:

1. Cut each sheet, both covers and inside pages, on the solid lines.
2. Lay the inside pages on top of one another in this order: pages 2 and 15, pages 4 and 13, pages 6 and 11, pages 8 and 9.
3. Fold the stacked pages on the dotted line, with pages 8 and 9 facing each other.
4. Turn the pages over so that pages 1 and 16 are on top.
5. Place the appropriate cover pages on top of the inside pages, with the front cover facing up.
6. Staple on the dotted line in two places.

You now have completed *Lots of Science Library Books*.



What are atoms?





protons
neutrons
electrons
nucleus

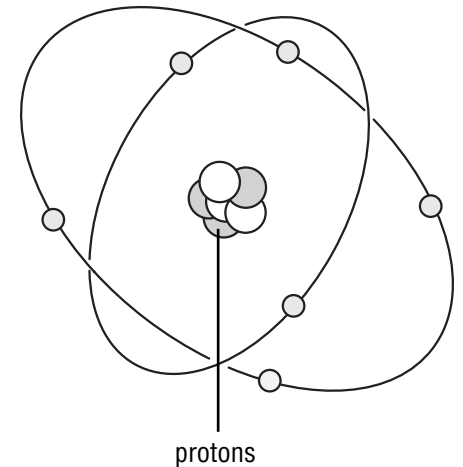
* subatomic



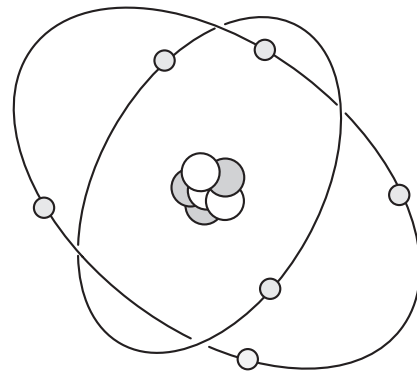
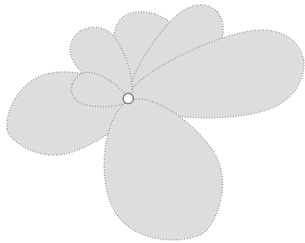
Electrons travel at an average distance from the nucleus, depending on their energy. These distances are referred to as energy levels.

Atoms are the building blocks of matter. A British chemist, John Dalton, first introduced the term "atom" when he presented his atomic theory in 1807. At that time, Dalton's theory stated that all matter was made up of tiny particles called atoms.

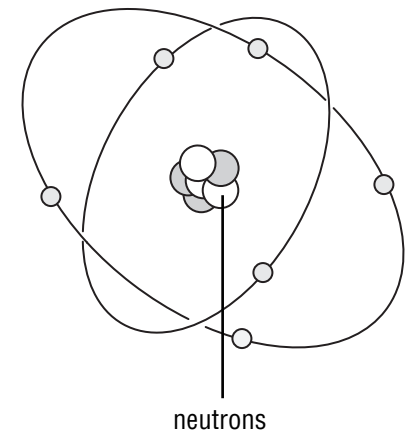
In 1906 the British scientist J.J. Thomson won the Nobel Prize in Physics for his work in discovering electrons in atoms. Thomson made the first model of the atom.



By 1926, scientists developed the electron cloud model of the atom used today.



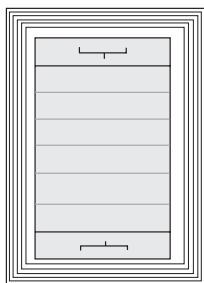
Since the nucleus is positively charged and the electrons are negatively charged, these particles attract each other keeping the atom together. Also, these opposite charges neutralize the atom so that the atom has no electrical charge itself.





Neutrons have no charge at all. Neutrons and protons are packed together in the center of the atom forming what is called the nucleus. This combination causes the nucleus to have a positive charge. The nucleus of the atom contains most of the mass.

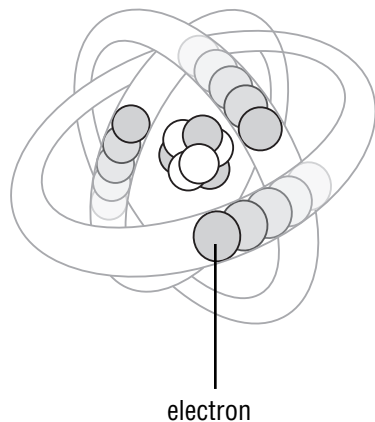
The majority of the space in an atom is empty. If the nucleus of an atom was a tiny grain of sand in the middle of a football field, the electrons would be moving around at the ends of the field.



Dalton also stated that atoms could not be made, destroyed, or divided. Dalton believed atoms of the same element were exactly alike but could be joined together to form larger particles. Dalton later suggested that an atom could be split into smaller parts and, eventually, he was proven correct.

Although scientists do not fully understand the paths of electrons new discoveries are made as more powerful microscopes are developed. Electrons move so quickly around the nucleus, it is impossible to describe their exact location in an atom.

Around the nucleus are electrons. Electrons are negatively charged and do repel each other. They orbit the nucleus, have a great amount of energy, and move very quickly in regions that are called shells, or energy levels.



Atoms have three subatomic parts: protons, neutrons, and electrons. Protons are positively charged. They are heavy and move very slowly. Even though like charged particles usually repel one another, protons are held together by a bonding energy.

Although it has been determined that electron shells are not similar to orbiting planets, these types of models are often used to easily represent a specific atom.

