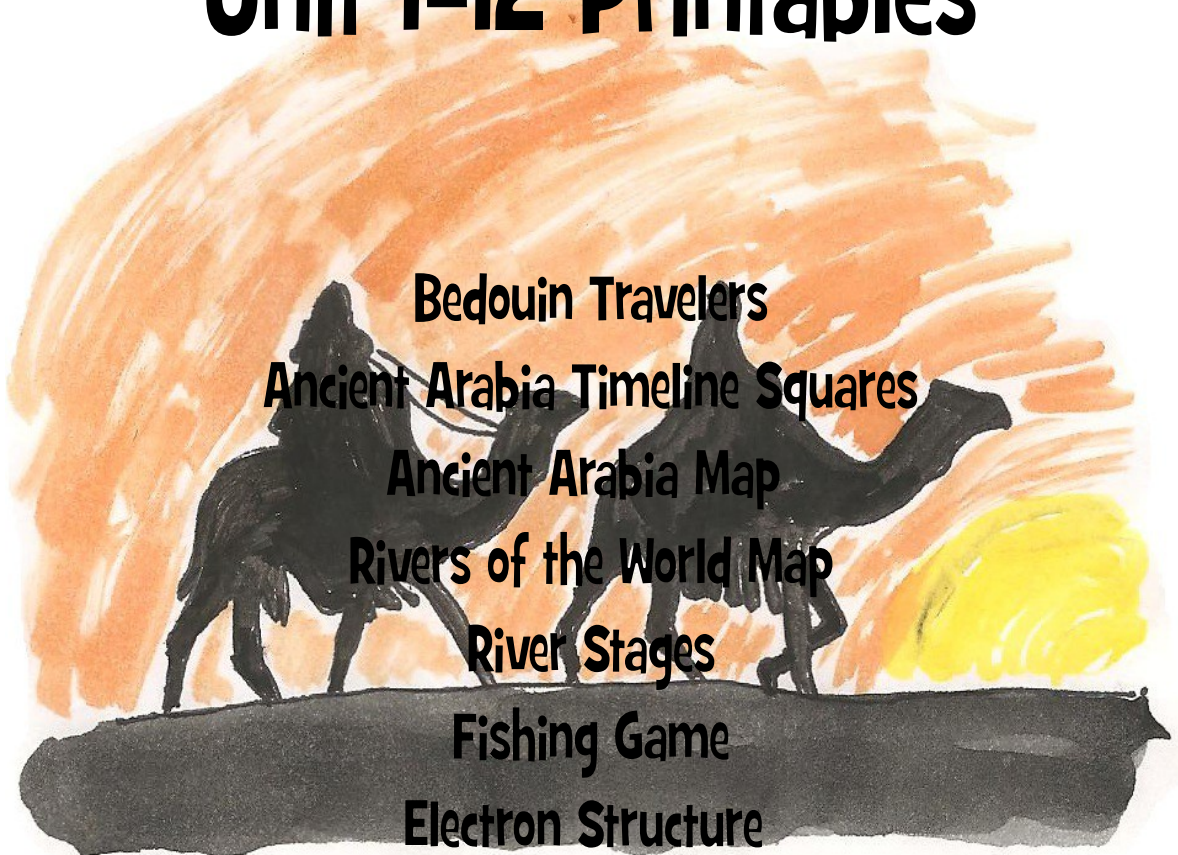


Layers of Learning



Unit 1-12 Printables



Filling the Electron Shells (plus answers)

Timeline of the Discovery of the Atom

Color Wheel

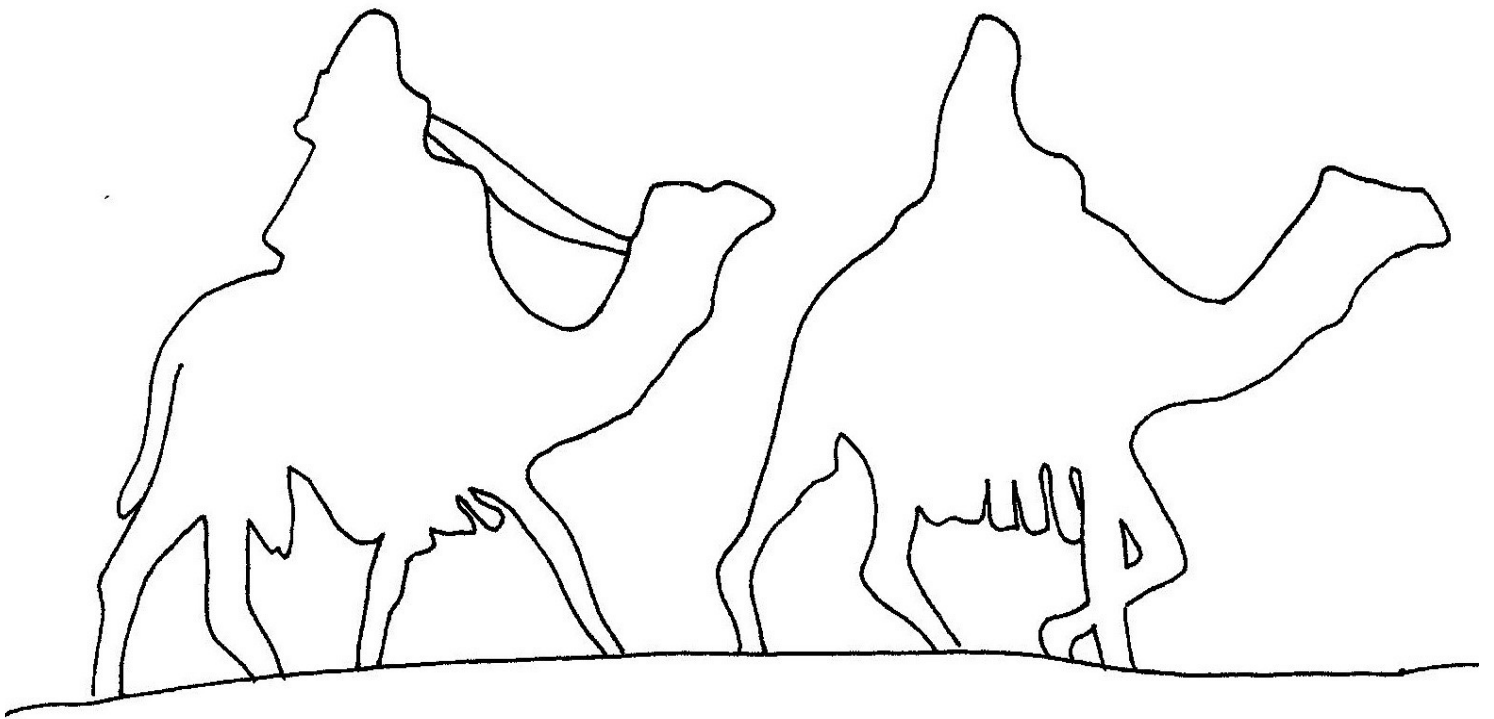
Color Values

Michelle Copher & Karen Loutzenhiser

Bedouin Travelers

Ancient Bedouins were nomadic. They traveled from place to place herding, fishing, transporting people and goods, and farming when they could. They mostly moved around because there wasn't much water, and they followed where the most water was.

Often Bedouin families traveled together. Family units were their most important division and loyalty was highly valued. Bedouins also valued honor. Sharaf was the name of their honor code. Telling the truth was so important that they had a special ritual for determining if someone was lying. It was called Bisha, or trial by fire, and involved licking a very hot object three times. If the accused had a burnt tongue from it, they had been lying according to the Bisha ceremony.



Ancient Arabia: Unit 1-12

c. 1000 BC I-12



Arabs tame camels

c. mid 900's I-12



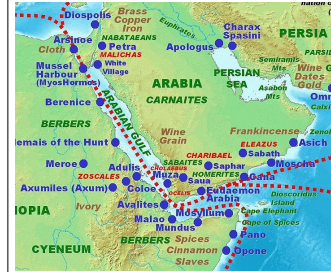
BC Queen of Sheba, sometimes called Balqis, reigns

c. 500BC -100AD I-12



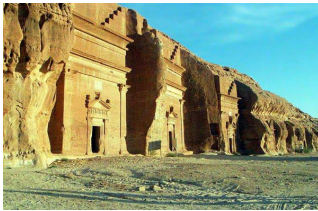
Kingdom of Sheba reaches its height

c. 300BC -100AD I-12



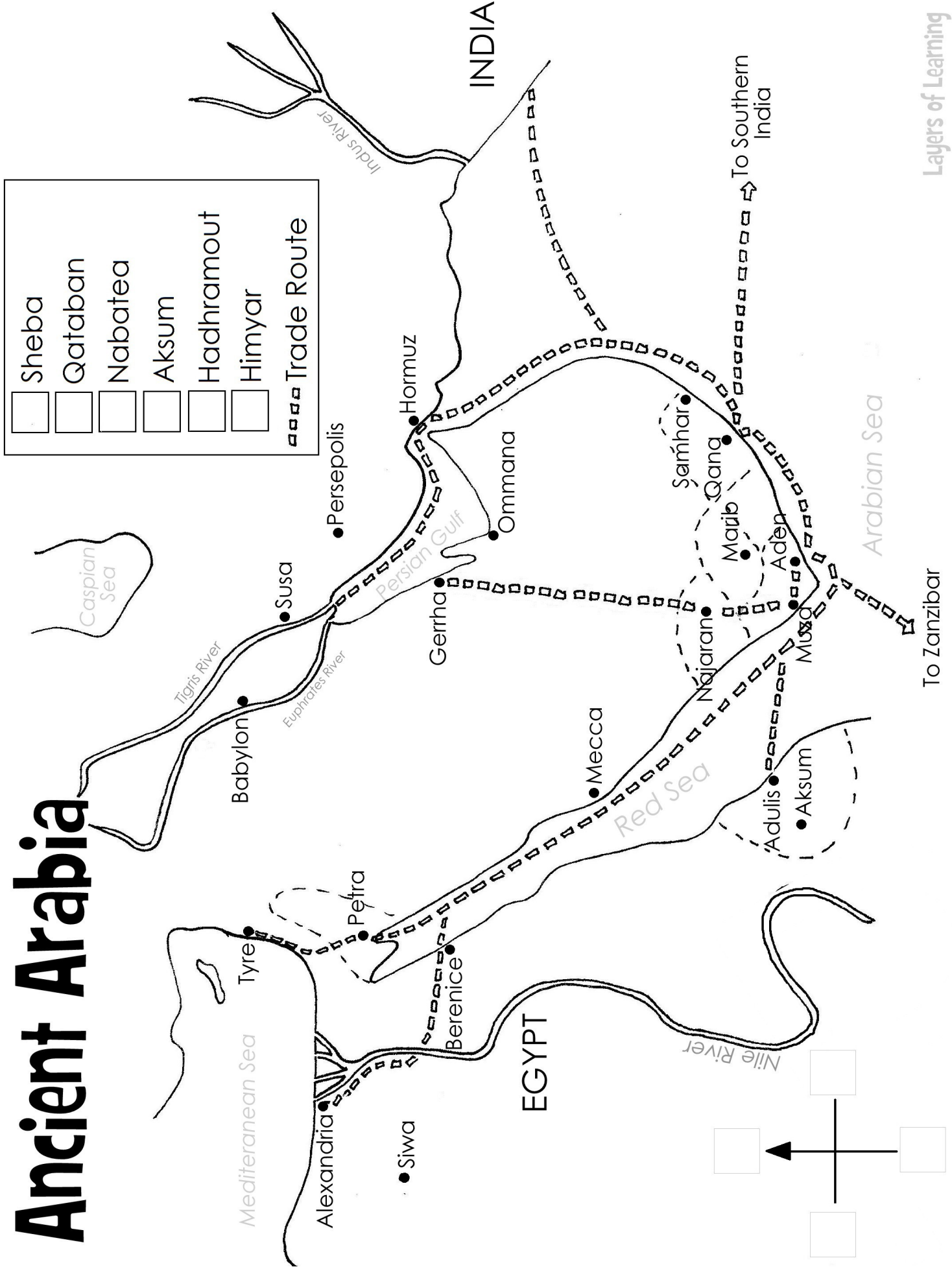
Incense Road flourishes

c. 100BC -150AD I-12

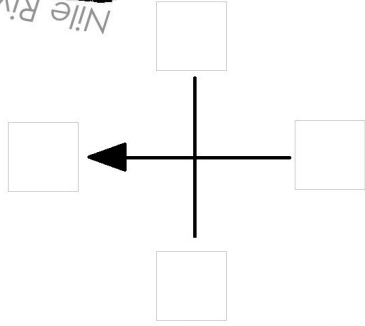


Kingdom of Nabataea becomes powerful

Ancient Arabia



	Sheba
	Qataban
	Nabatea
	Aksum
	Hadhramout
	Himyar
	Trade Route



Rivers of the World

NORTH AMERICA

Mississippi River
Mackinzie River
St. Lawrence River
Rio Grande
Missouri River
Ohio River
Arkansas River
Great Lakes
Lake Winnipeg
Great Slave Lake
Great Bear Lake

ASIA

Lena River
Ob River
Ganges River
Yellow River
Mekong River
Lake Baikal
Indus River
Amur River
Yangtze River
Euphrates River

EUROPE

Danube River
Volga River

SOUTH AMERICA

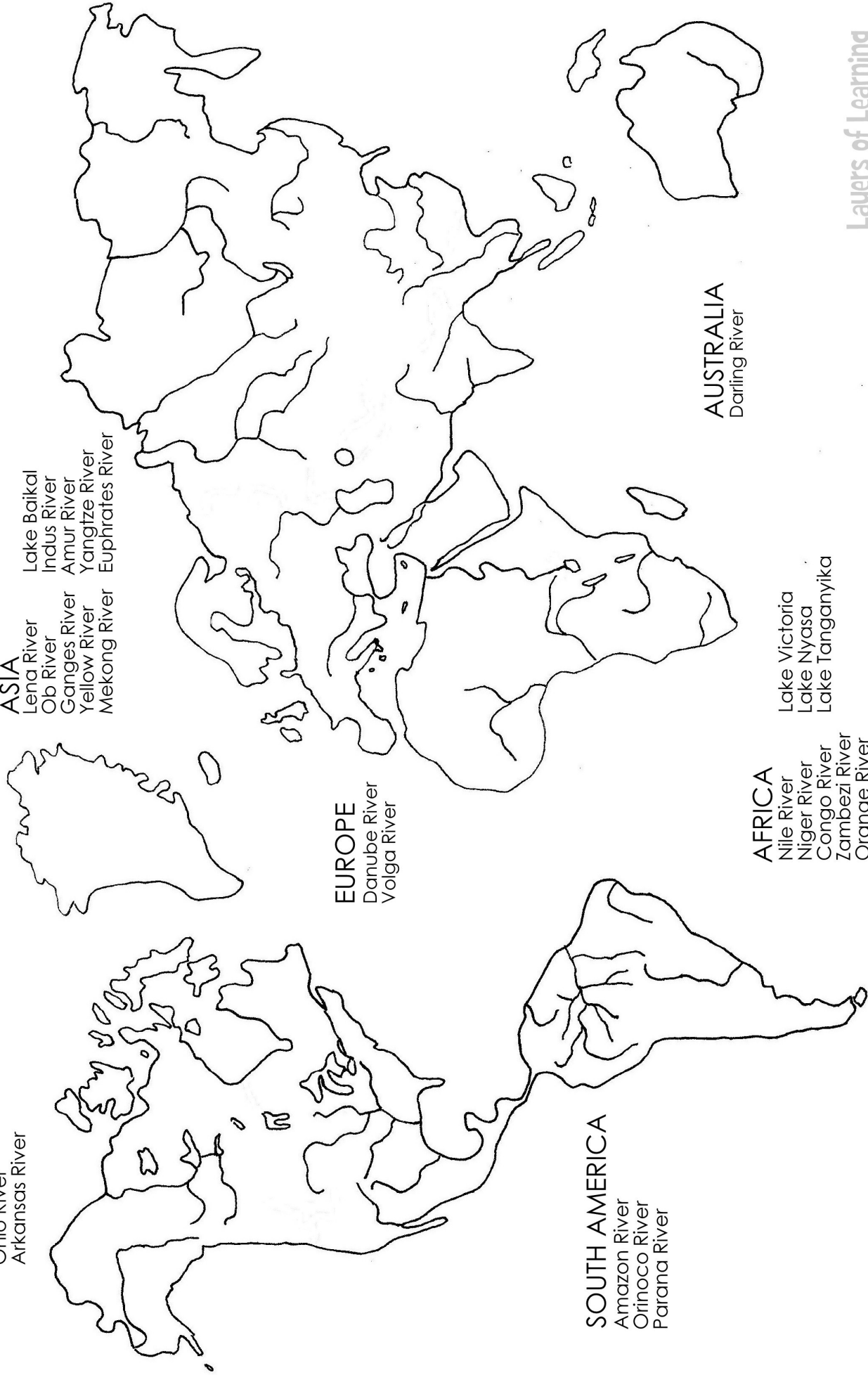
Amazon River
Orinoco River
Parana River

AFRICA

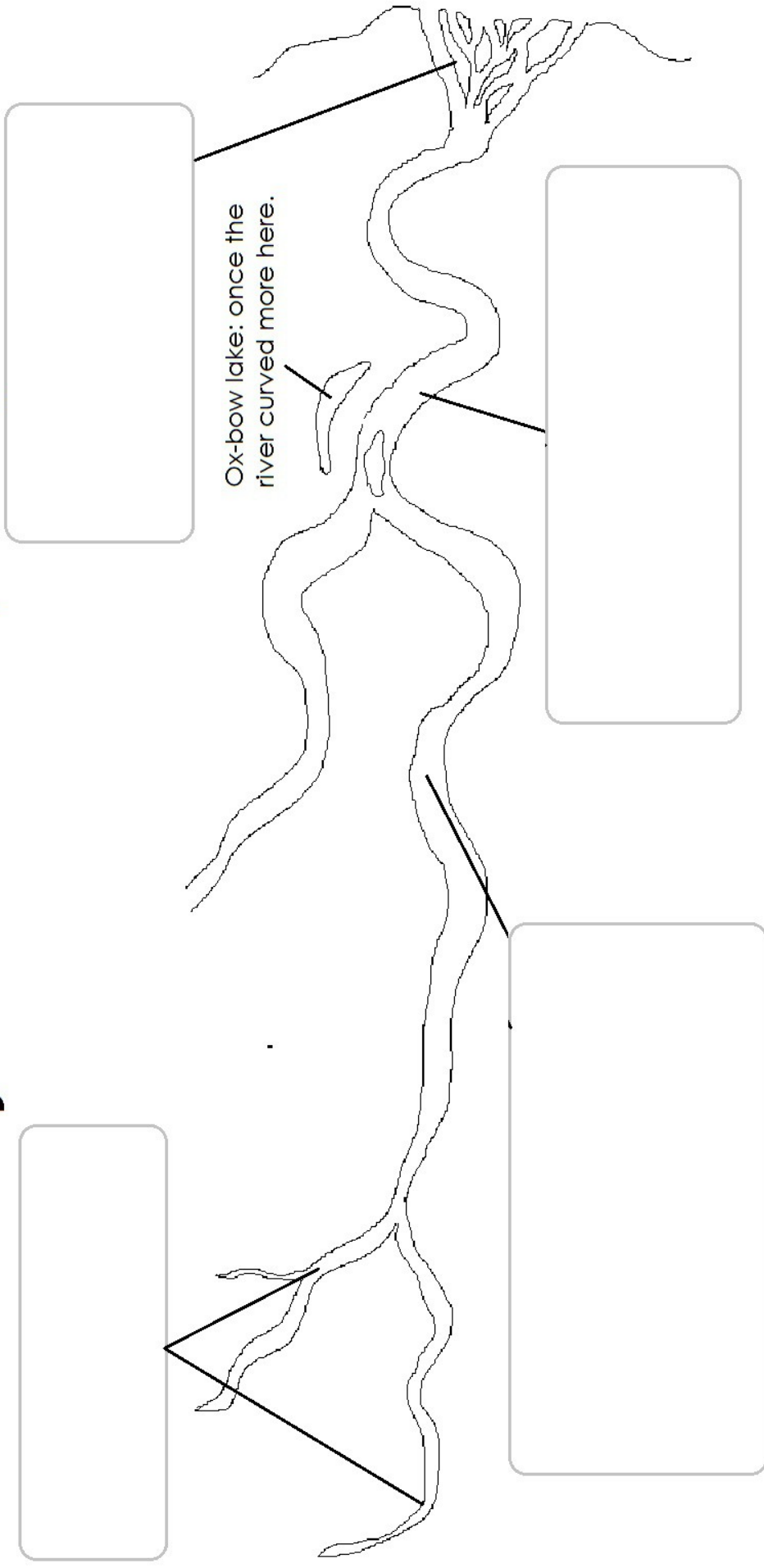
Nile River
Niger River
Congo River
Zambezi River
Orange River
Lake Victoria
Lake Nyasa
Lake Tanganyika

AUSTRALIA

Darling River



River Stages: Erosion, Transport, Deposition

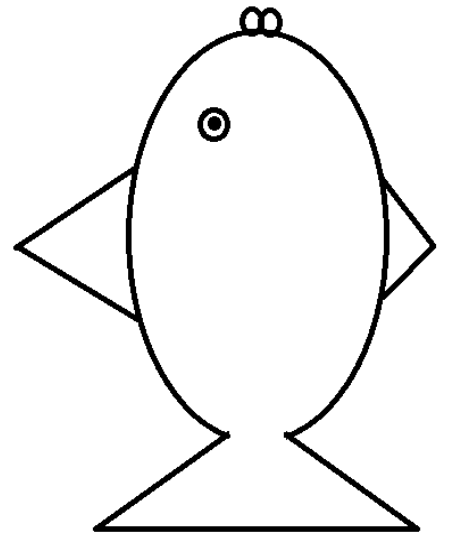
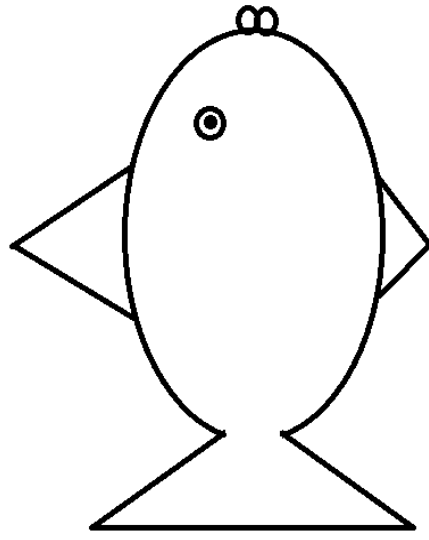
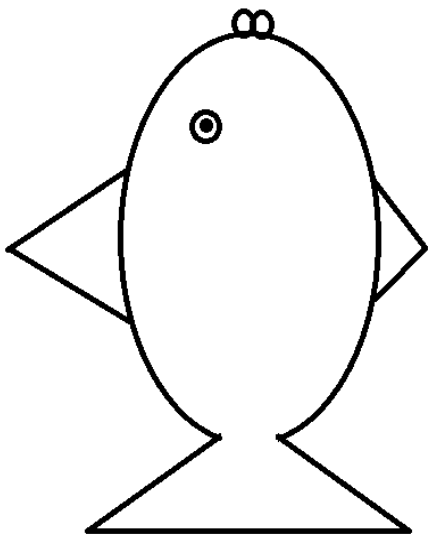
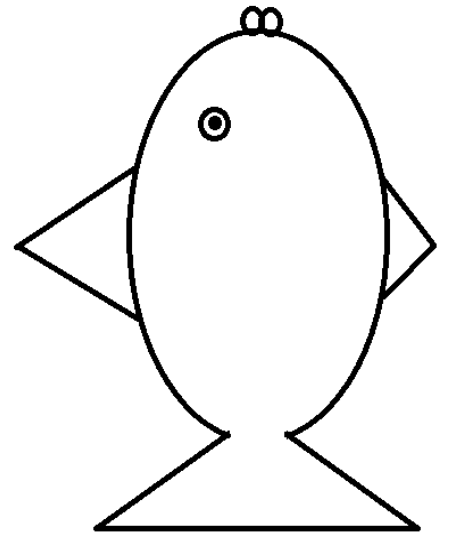
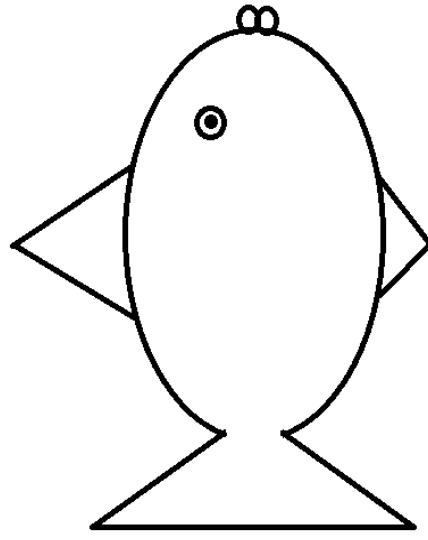
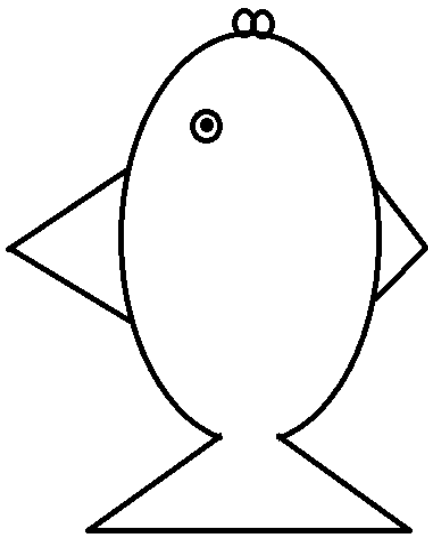
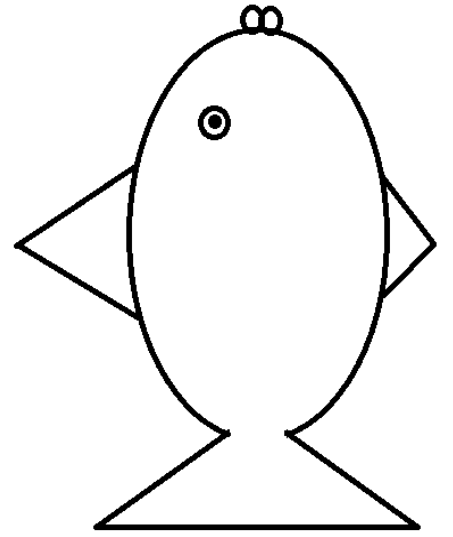
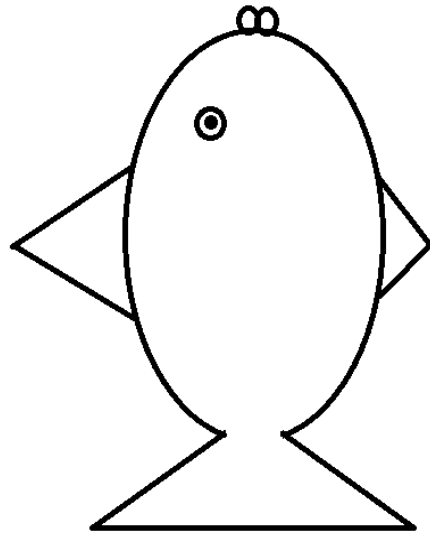
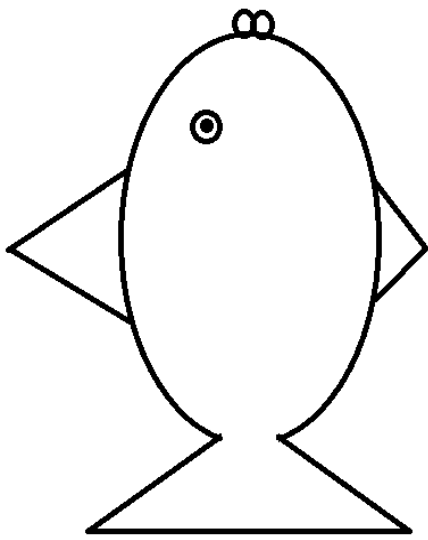


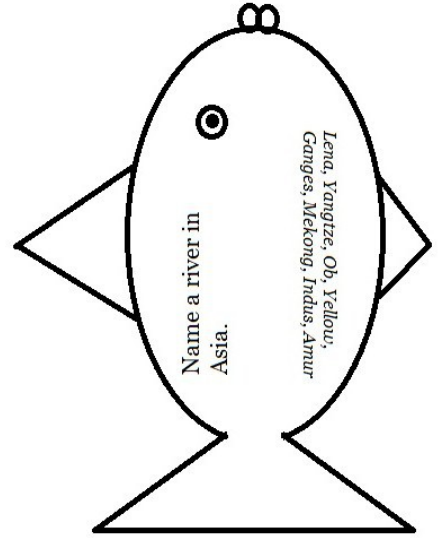
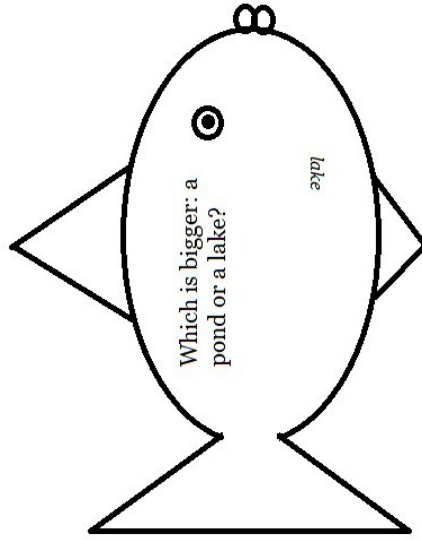
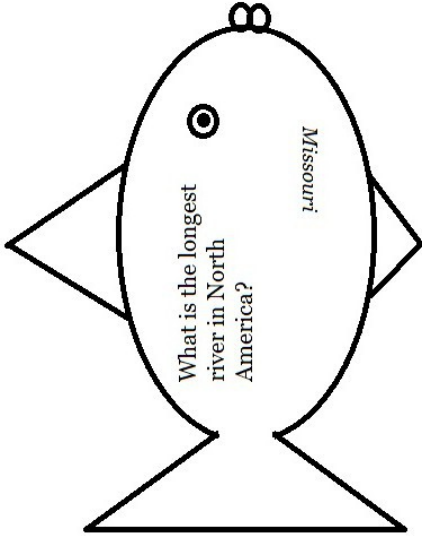
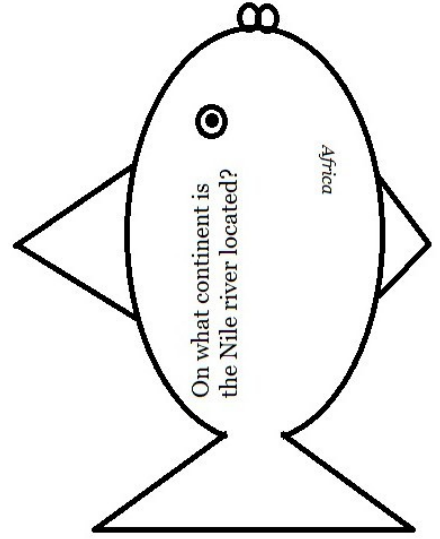
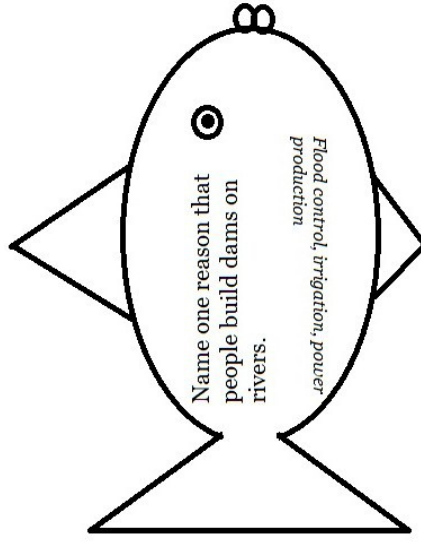
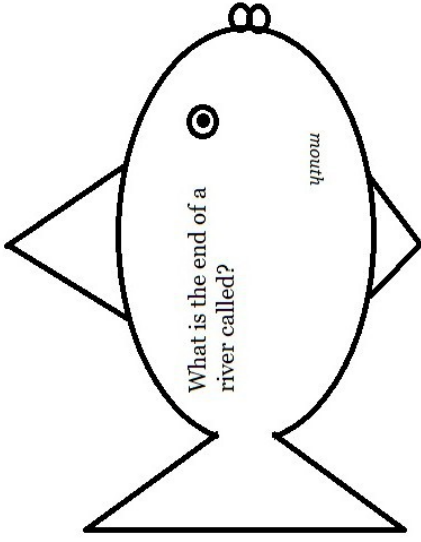
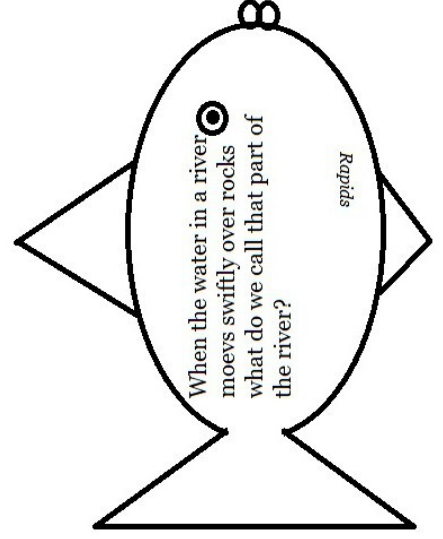
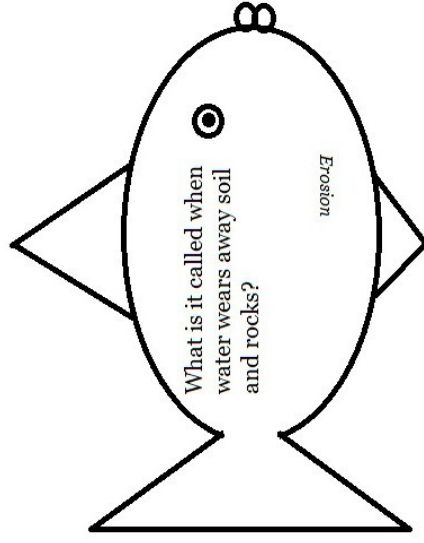
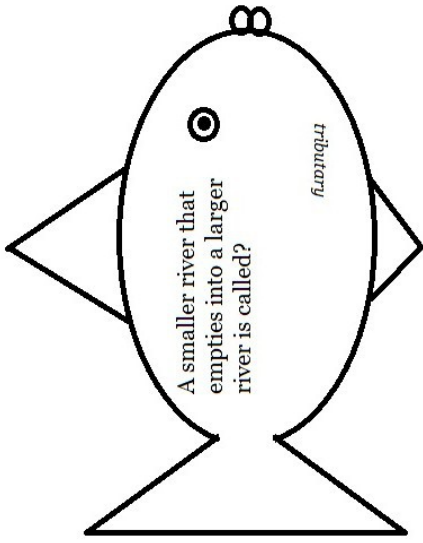
A young river, near the source, flows quickly and erodes the land

At the end of the river, many islands of deposits are sometimes formed creating a delta.

A river in the middle courses carries a lot of sediment with it. It begins to deposit sediment on near banks and sometimes on the upstream side of blockages or slow spots, forming islands.

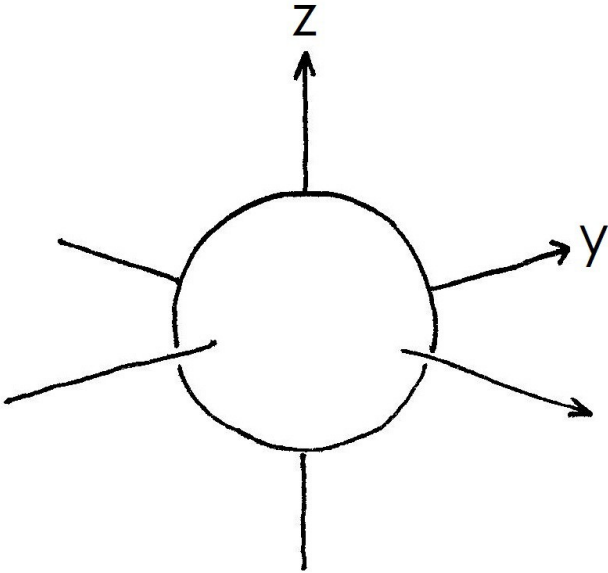
An older, slower river meanders slowly, depositing sediment on the upstream side of curves and wearing away banks.



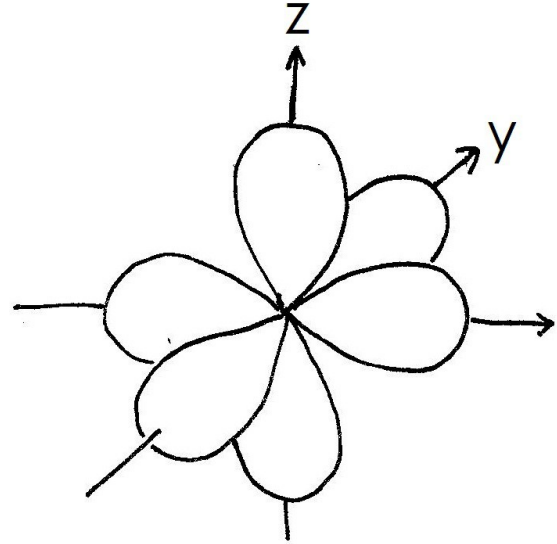


Electron Structure

S orbital

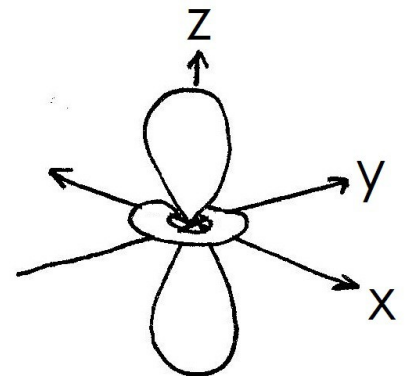
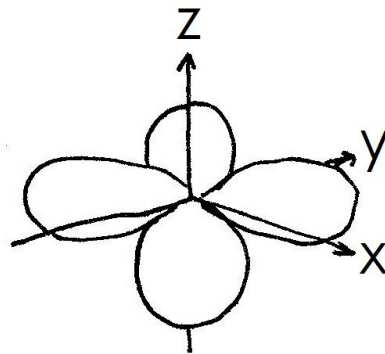
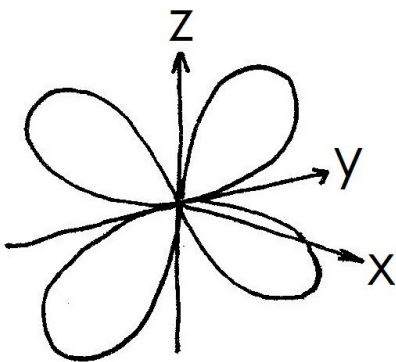


P orbital



Each orbital contains how many electrons? _____

D orbital

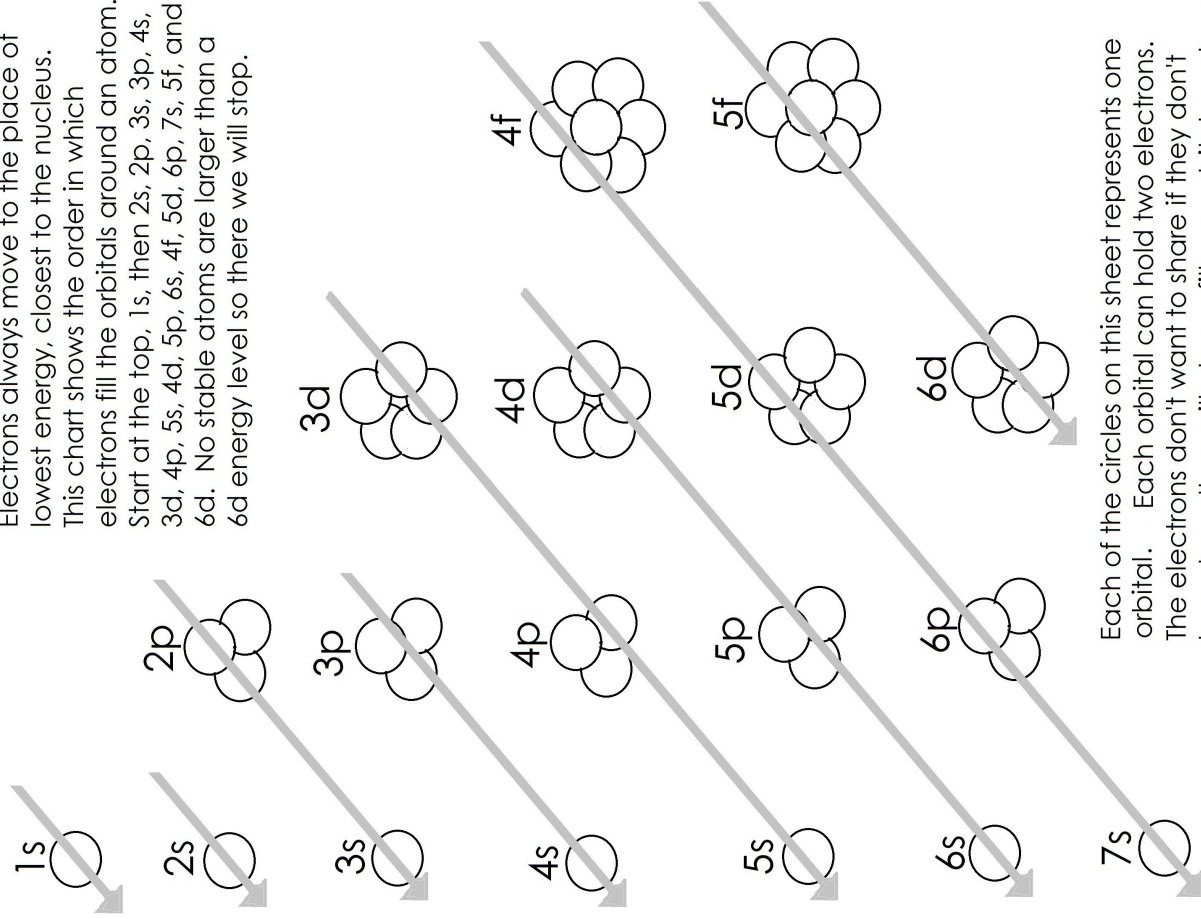


The D orbital is shown in three parts, but really they exist all together. It's broken up so you can see it properly.

F orbitals are incredibly complicated and messy, so we're not showing them.

Filling the Electron Shells

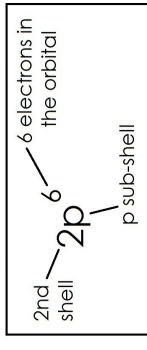
Electrons always move to the place of lowest energy, closest to the nucleus. This chart shows the order in which electrons fill the orbitals around an atom. Start at the top, 1s, then 2s, 2p, 3s, 3p, 4s, 3d, 4p, 5s, 4d, 5p, 6s, 4f, 5d, 6p, 7s, 5f, and 6d. No stable atoms are larger than a 6d energy level so there we will stop.



Each of the circles on this sheet represents one orbital. Each orbital can hold two electrons. The electrons don't want to share if they don't have to so they will always fill one orbital each on a sub-shell until there are enough electrons that they have to share.

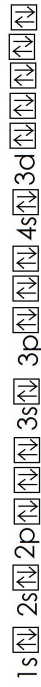
- How many electrons can an s orbital hold? _____
- How many electrons can a p orbital hold? _____
- How many electrons can a d orbital hold? _____
- How many electrons can an f orbital hold? _____

The element Iodine has 53 electrons. If I put two electrons each in orbitals until all 53 electrons are used up I could see which shells the electrons in Iodine are occupying. Chemists have a way of writing down the way an element fills its shells and orbitals.



Here is the notation for Iodine:
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^5$

And here is another way to show where the electrons fall in Iodine:



Each arrow represents an electron. Electrons have a "spin", so one is shown with an up arrow and the other is shown with a down arrow. The only unpaired electron is the last one in the 5p orbital.

Carbon has 6 electrons. Write the notation and draw the arrow notation for Carbon.

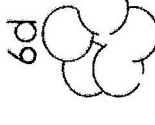
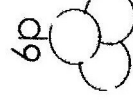
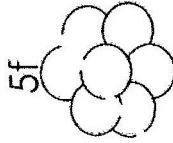
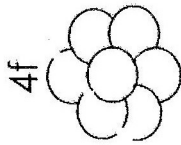
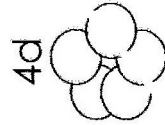
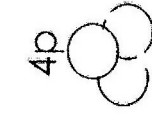
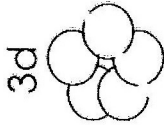
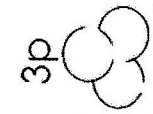
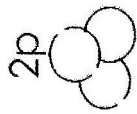
Magnesium has 12 electrons. Write the notation and draw the arrow notation for Magnesium.

Iron has 26 electrons. Write the notation and draw the arrow notation for Iron.

Filling the Electron Shells

ANSWER SHEET

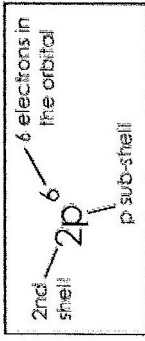
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Each of the circles on this sheet represents one orbital. Each orbital can hold two electrons. The electrons don't want to share if they don't have to so they will always fill one orbital each on a sub-shell until there are enough electrons that they have to share.

How many electrons can an s orbital hold? 2
 How many electrons can a p orbital hold? 6
 How many electrons can a d orbital hold? 10
 How many electrons can an f orbital hold? 14

The element Iodine has 53 electrons. If I put two electrons each in orbitals until all 53 electrons are used up I could see which shells the electrons in Iodine are occupying. Chemists have a way of writing down the way an element fills its shells and orbitals.



Here is the notation for Iodine:
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^5$

And here is another way to show where the electrons fall in Iodine:

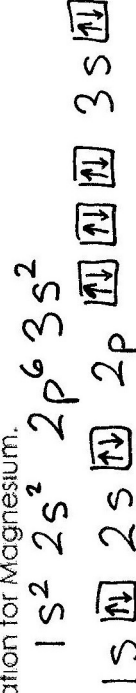


Each arrow represents an electron. Electrons have a "spin", so one is shown with an up arrow and the other is shown with a down arrow. The only unpaired electron is the last one in the 5p orbital.

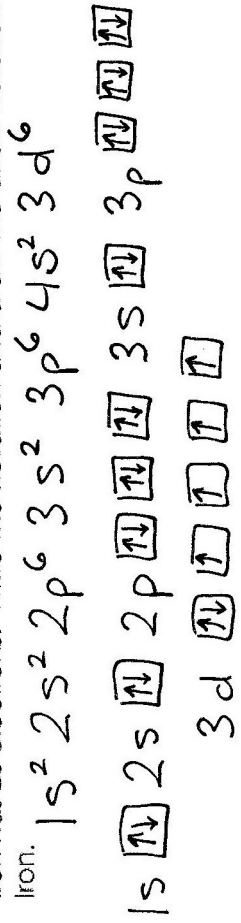
Carbon has 6 electrons. Write the notation and draw the arrow notation for Carbon. $1s^2 2s^2 2p^2$



Magnesium has 12 electrons. Write the notation and draw the arrow notation for Magnesium.

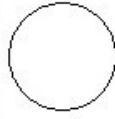


Iron has 26 electrons. Write the notation and draw the arrow notation for Iron.



Timeline of the Discovery of the Atom Figures

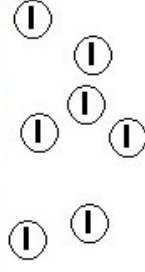
Atom



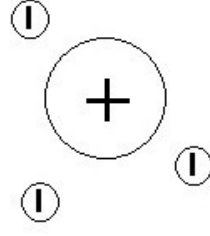
Periods of Atoms

<i>I</i>	Li	Na
<i>II</i>	Be	Mg
<i>III</i>	B	Al
<i>IV</i>	C	Si
<i>V</i>	N	

Electrons



Rutherford's Atom

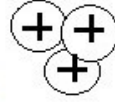


Protons

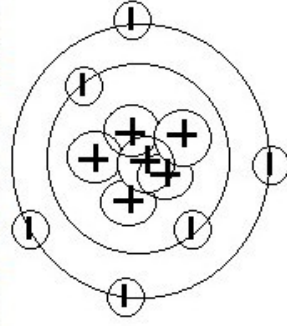
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Atomic Number

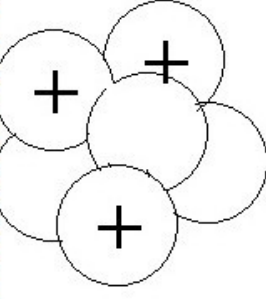
Li³



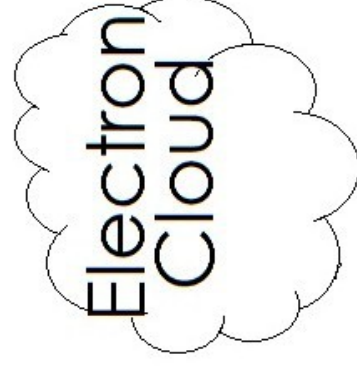
Bohr's Atom



Neutrons



Electron Cloud



Color Wheel

Fill in this color wheel. Start by painting the primary colors in the center ring – red, yellow and blue. Now you'll paint the secondary colors in the middle ring. Where red and blue intersect, mix red and blue on your paint tray and paint it in that section, etc. Now continue to paint the tertiary colors in the outer ring.

