

# Layers of Learning



## Unit 1-15 Printables



**North America Political Map**

**North America Physical Map**

**New York Skyline**

**Mexico Map**

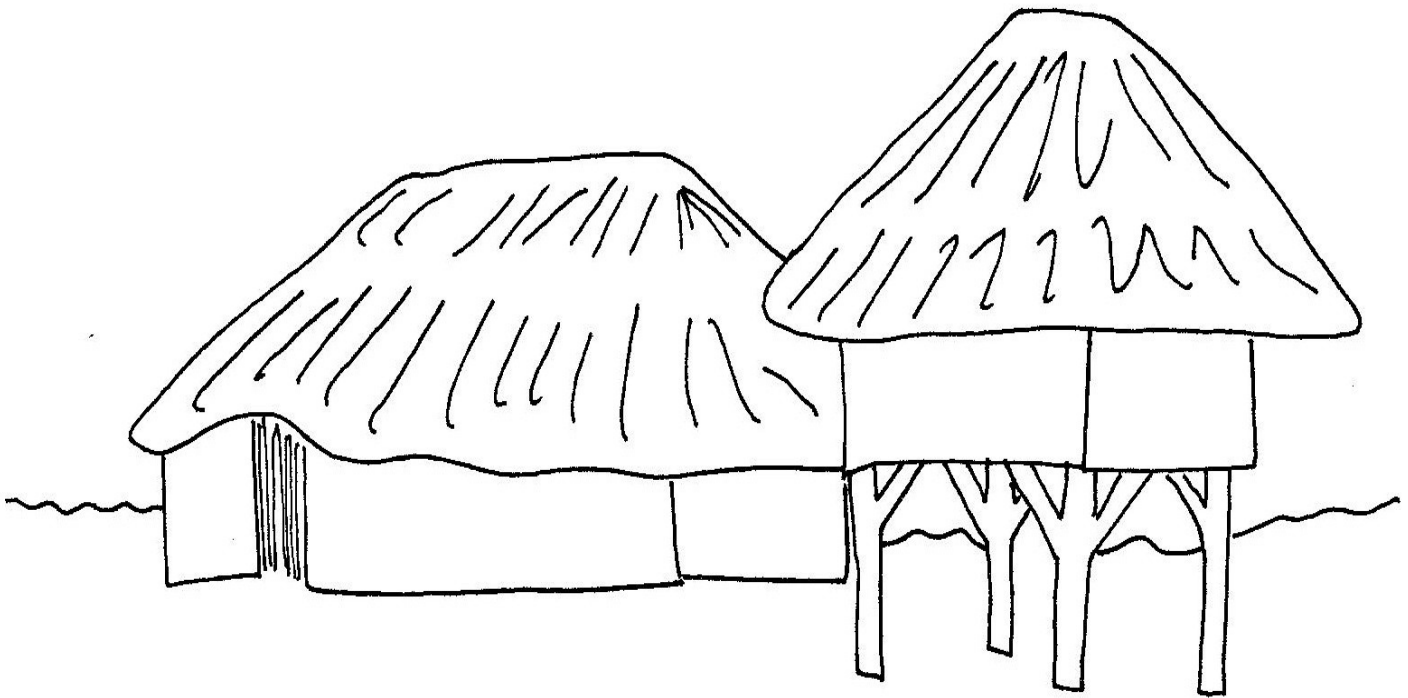
**Periodic Table of the Elements**

**Half-Life Equations**

Michelle Copher & Karen Loutzenhiser

# Ancient North American Homes

These are buildings from North American cultures of the Ohio Valley. The walls are built of posts and covered with mud, similar to wattle and daub houses of ancient Europe. The roofs are thatch. The little building is on stilts to keep it out of the water and away from critters. It is where the people who live in the house store their harvest of maize and other crops.



# Ancient North America: Unit I-15

**1200-400BC** I-15



Olmec people

**1000-300BC** I-15



Adena people

**300BC-550AD** I-15



Hopewell people

**300BC-900AD** I-15



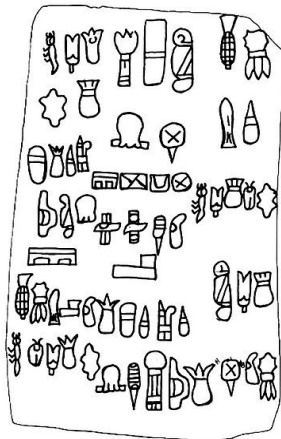
Maya people

**5000 BC** I-15



Corn (maize) is systematically bred to resemble modern forms.

**32 BC** I-15



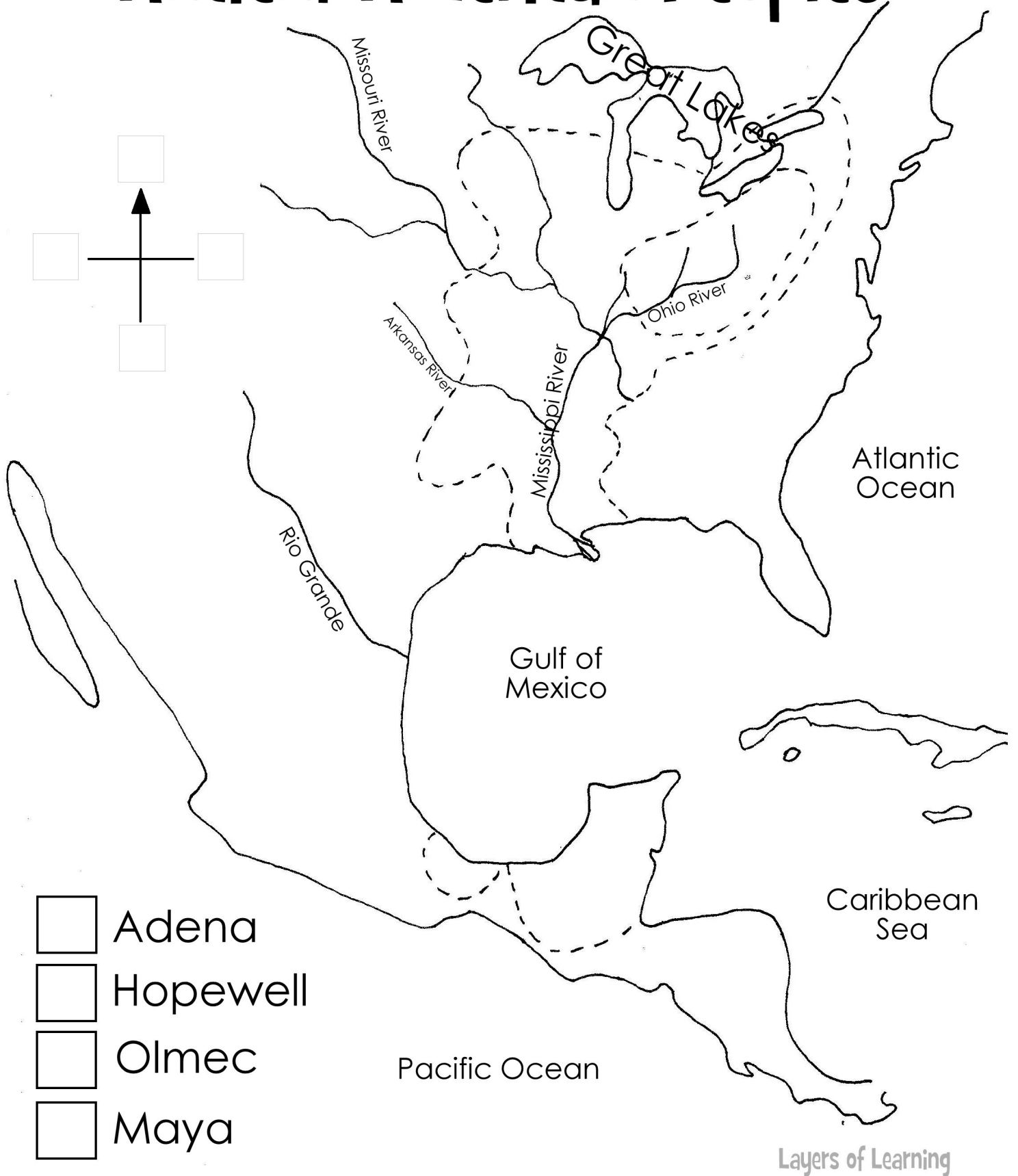
Olmecs begin to use zero as a place holder in calculations

**1000 AD** I-15



city of Chahokia (near St. Louis) rises

# Ancient American Peoples



From the Madison Democrat.  
 March 20, 1906

37

## Who Built the Wisconsin Mounds?

Who built the mounds of Wisconsin? From the advent of the whites the problem of the mound-builders has been a more intricate one than it was when the scientific world was wrestling with the curious earth structures in Ohio and other older sections of the country. There is a strange individuality in the earth-works of Wisconsin, different from those of other parts, and the most perplexing thing about the problem is whether the builders here were the originators of the work, or did they attempt to copy the structures of other aboriginal peoples? The Indians found here by the first whites were ignorant of the origin or purpose of the mounds, although we read occasionally of their using the circular heaps of earth in some of their ceremonies. But they claimed to know nothing of their building nor of their builders.

The most common forms in which these mounds were constructed and in which the whites found them are,—round mole hills, called tumulus; in imitation of birds and animals, called effigy mounds, and long horizontal ridges. Probably the tumuli are the most numerous, and these are in all sizes. One of the largest in this vicinity is about four miles southwest of Prairie du Sac, which measures 63 feet in diameter across the base and is now 13 feet in height at the summit. This stands in the woods and has not been leveled in an attempt to work the land. Many are not more than two or three feet in height, and a large percentage of those that were found by early settlers are entirely obliterated by years of plowing and harrowing. Of the effigy mounds those in the form of birds are most numerous, although

there are plenty that mark the outlines of the lizard, deer, bear and other animals so plainly that nobody can mistake the intent of the artists who shaped them. Some of the bird mounds are especially attractive to look upon. Many are very large, the one shown here having a stretch of wing clearly marked of 396 feet.

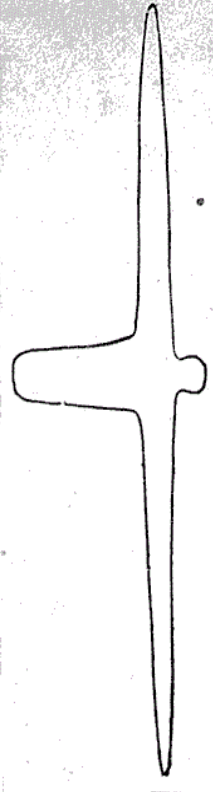
The body has a width of 14 feet and the elevation above the surrounding soil is two and a half feet. As one stands upon the body the whole outline is so perfect that he cannot mistake it. Many of them are much smaller. One of the most perfect specimens near Madison is on the shores of Devil's lake at Kirkland. Although in front of the old hotel where thousands have tramped over it for years, the lines are yet perfect. It has a stretch of about 110 feet from tip to tip.

There is up in Sauk county, four miles northeast of Baraboo, a man mound that has attracted visitors from all over this country and Europe. Of the few man mounds known, this is the most perfect. It has an extreme length of 290 feet, with arms, legs and feet perfectly outlined and is capped with a headress that has the general look of feathers. This is on land not cultivated, and is in a good state of preservation, except that the legs have been cut in two by the public road.

In many places they are in groups, as large a number as 63 having been located in a row not more than a

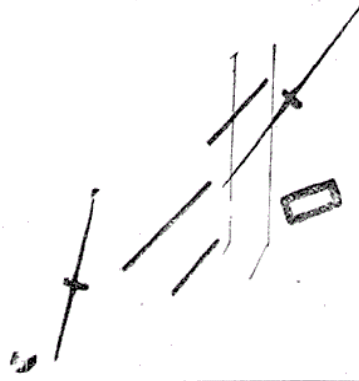


Man Mound.



A Symmetrical Bird Mound.

quarter of a mile in length. The good state of preservation. About the only point on which scientists are agreed relative to these mounds is that they prove that this section was once, densely populated. No such Indian settlements as we have knowledge of could have built them. In about every instance the earth from which they were constructed was carried—it is different from the soil on which the mounds rest. The earth from which a large tumulus was made came at least 40 rods; there is no soil like that in the mound nearer than that. Of course these earthworks were much larger when built, and their present size is no mark of the labor required to build them. Centuries of freezing and thawing, rain and sunshine have reduced them more than half. With the crude appliances of the aborigines for digging and carrying the earth, it must have required an army of people a long time to build them. The question remains unsolved, who built the Wisconsin mounds?



An Interesting Group.

Here is shown two bird mounds, three ridges, a tumulus and what was probably the wall for a dwelling. All are greatly reduced, the upper bird mound being nearly 400 feet in length.

There are many mounds about lakes Mendota and Monona, but no systematic effort has been made to survey, plat and preserve them. Two or three are on the university grounds and on the hills beyond are many more. In Sauk county the historical society has been making a thorough survey of the aboriginal earthworks in that section and has covered seven townships of the county. In these were located 734 mounds, one-half of which are in a

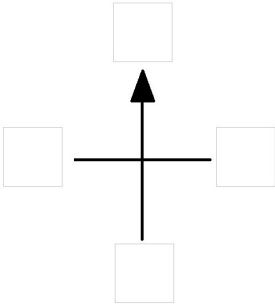
State Historical Society  
 OF WISCONSIN  
 MADISON - WIS.



*Photograph by Thelmadatter and shared on Wikimedia commons.*



# North America

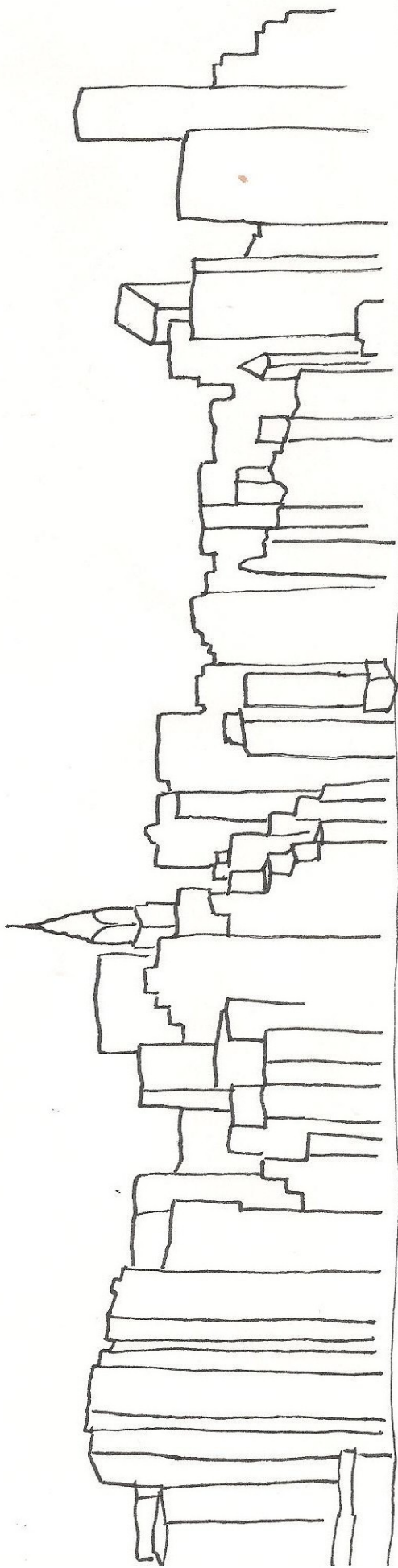




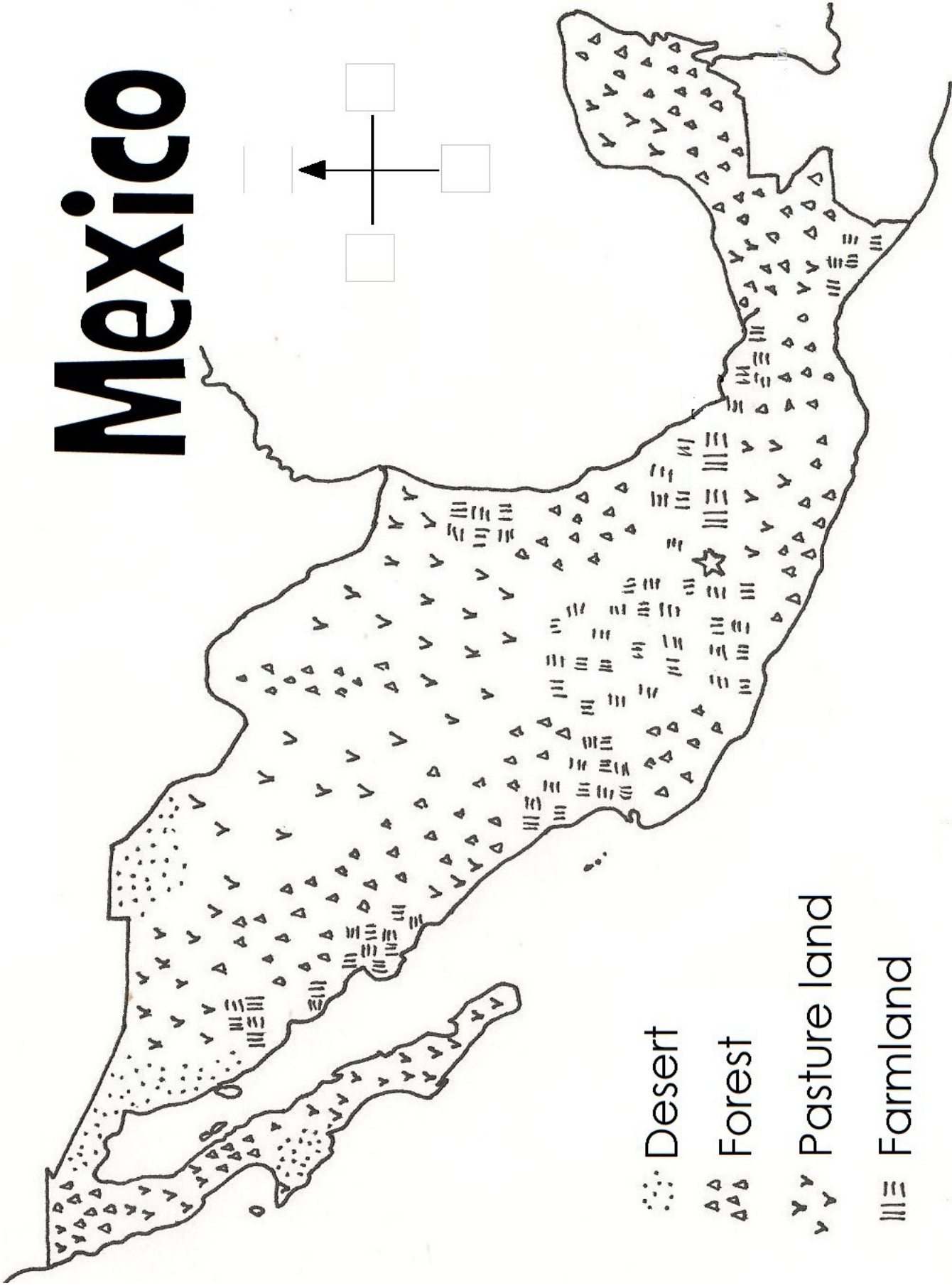
# North America



# NEW YORK CITY SKYLINE



# Mexico



••• Desert

△△△ Forest

v v Pasture land

|||≡ Farmland

# Periodic Table of the Elements

1 H Hydrogen 1.0																	2 He Helium 4.0	
3 Li Lithium 6.9	4 Be Beryllium 9.0															9 F Fluorine 19.0	10 Ne Neon 20.2	
11 Na Sodium 23.0	12 Mg Magnesium 24.3															17 Cl Chlorine 35.5	18 Ar Argon 40.0	
19 K Potassium 39.1	20 Ca Calcium 40.1	21 Sc Scandium 45.0	22 Ti Titanium 47.9	23 V Vanadium 50.9	24 Cr Chromium 52.0	25 Mn Manganese 54.9	26 Fe Iron 55.9	27 Co Cobalt 58.9	28 Ni Nickel 58.7	29 Cu Copper 63.5	30 Zn Zinc 65.4	31 Ga Gallium 69.7	32 Ge Germanium 72.6	33 As Arsenic 74.9	34 Se Selenium 79.0	35 Br Bromine 79.9	36 Kr Krypton 83.8	
37 Rb Rubidium 85.5	38 Sr Strontium 87.6	39 Y Yttrium 88.9	40 Zr Zirconium 91.2	41 Nb Niobium 92.9	42 Mo Molybdenum 95.9	43 Tc Technetium 99	44 Ru Ruthenium 101.0	45 Rh Rhodium 102.9	46 Pd Palladium 106.4	47 Ag Silver 107.9	48 Cd Cadmium 112.4	49 In Indium 114.8	50 Sn Tin 118.7	51 Sb Antimony 121.8	52 Te Tellurium 127.6	53 I Iodine 126.9	54 Xe Xenon 131.3	
55 Cs Cesium 132.9	56 Ba Barium 137.3	Lanthanides 57-71		72 Hf Hafnium 178.5	73 Ta Tantalum 180.9	74 W Tungsten 183.9	75 Re Rhenium 186.2	76 Os Osmium 190.2	77 Ir Iridium 192.2	78 Pt Platinum 195.1	79 Au Gold 197.0	80 Hg Mercury 200.6	81 Tl Thallium 204.4	82 Pb Lead 207.2	83 Bi Bismuth 209.0	84 Po Polonium 210.0	85 At Astatine 211	86 Rn Radon 222.0
87 Fr Francium 223.0	88 Ra Radium 226.0	Actinides 89-103		104 Rf Rutherfordium 267	105 Db Dubnium 268	106 Sg Seaborgium 271	107 Bh Bohrium 272	108 Hs Hassium 270	109 Mt Meitnerium 276	110 Ds Darmstadtium 281	111 Rg Roentgenium 280	112 Cn Copernicium 285	113 Nh Nihonium 284	114 Fl Flerovium 289	115 Uup Ununpentium 288	116 Lv Livermorium 293	117 Uus Ununseptium 294	118 Uuo Ununoctium 294

57 La Lanthanum 138.9	58 Ce Cerium 140.1	59 Pr Praseodymium 140.9	60 Nd Neodymium 144.2	61 Pm Promethium 145	62 Sm Samarium 150.4	63 Eu Europium 152.0	64 Gd Gadolinium 157.3	65 Tb Terbium 158.9	66 Dy Dysprosium 162.5	67 Ho Holmium 164.0	68 Er Erbium 167.3	69 Tm Thulium 168.9	70 Yb Ytterbium 173.0	71 Lu Lutetium 175.0
89 Ac Actinium 227.0	90 Th Thorium 232.0	91 Pa Protactinium 231.0	92 U Uranium 238.0	93 Np Neptunium 237	94 Pu Plutonium 242	95 Am Americium 243	96 Cm Curium 247	97 Bk Berkelium 247	98 Cf Californium 251	99 Es Einsteinium 254	100 Fm Fermium 253	101 Md Mendelevium 256	102 No Nobelium 254	103 Lr Lawrencium 257

# Half-Life Equations

A half-life is the amount of time it takes for half of a sample of a radioactive element to decay.

Radon-222 has a half-life of 3.8 days. If you start with a 100g sample, how much is left after 15.2 days?

$$15.2 \text{ days} \times \frac{1 \text{ half-life}}{3.8 \text{ days}} = 4 \text{ half-lives}$$

1 half-life = 50g  
2 half-lives = 25g  
3 half-lives = 12.5g  
4 half-lives = **6.25g**

1. Carbon-14 has a half-life of 5730 years. If you start with a 100g sample, how much will be left after 11,460 years?

2. If 100g of gold-198 has a half-life of 2.696 days, how much will you have left after 8.088 days?

3. Radon-226 has a half-life of 1600 years. How long will it take for a 28g sample of Radon to decay to 3.5g?

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$$\begin{aligned} 1 \text{ half-life} &= 50\text{g} \\ 2 \text{ half-lives} &= 25\text{g} \\ 3 \text{ half-lives} &= 12.5\text{g} \\ 4 \text{ half-lives} &= \mathbf{6.25\text{g}} \end{aligned}$$

1. Carbon-14 has a half-life of 5730 years. If you start with a 100g sample, how much will be left after 11,460 years?

$$11460 \times \frac{1 \text{ half-life}}{5730} = 2 \text{ half-lives}$$

$$\begin{aligned} 1 \text{ half life} &= 50 \\ 2 \text{ half-lives} &= \mathbf{25} \end{aligned}$$

2. If 1g of gold-198 has a half-life of 2.696 days, how much will you have left after 8.088 days?

$$8.088 \times \frac{1 \text{ half-life}}{2.696} = 3$$

$$\begin{aligned} 1 \text{ half-life} &= .5 \\ 2 \text{ half lives} &= .25 \\ 3 \text{ half lives} &= \mathbf{.125} \end{aligned}$$

3. Radon-226 has a half-life of 1600 years. How long will it take for a 28g sample of Radon to decay to 3.5g?

$$3 \text{ half lives} = 3.5 \times 2 = 7 \times 2 = 14 \times 2 = 28$$

$$3 \times 1600 = \mathbf{4800 \text{ years}}$$