South Dakota Transportation
South Dakota State Historical Society Education Kit

Table of Contents

Goals and Materials

Goals
Kit users will:
- explore various transportation methods used in South Dakota
- understand how transportation methods change over time
- gain knowledge and experience in learning from objects

Materials
This kit contains:
(kit 1)

1 wagon model
1 bit
1 stirrup
1 bridle
2 horseshoes
1 steamboat china plate
1 railroad spike
1 train whistle
1 pocket watch
1 Northern Pacific timetable
1 Milwaukee Road brochure
1 SD 1910 Railroad map
2 car models
1 gas pump
2 license plates
2 airline safety cards
1 Continental Airlines cup

1 battery tester
1 tire pump
1 tire iron
1 tube repair kit
1 auto flare
1 hatbox
1 pheasant feather hat
1 dashboard compass
1 SD Driver's License Manual
6 SD Highway maps
1 concrete pavement sample
1 asphalt pavement sample
1 stop sign
1 railroad crossing sign
1 Northwest 757 airplane model
1 deck of American Airlines
     playing cards

Teacher Resource Paper

Transportation played a vital role in South Dakota's development. Yesterday's settlers arrived by trail, steamboat, and railroad. Today, state residents travel across the state on interstate highways, and fly to all parts of the world. Our products are shipped everywhere – by truck, train, and airplane. South Dakota would be a much different place without transportation systems.

River Travel

The Missouri River was a Native American river road. They settled along the river. Plains tribes traveled its waters in carved log canoes and buffalo skin bullboats. The river connected different tribes and made trade between them possible.[1] Trading posts and military forts located along the Missouri for easy access and added security. Early white settlements also located along the Missouri.

One well-known journey along the Missouri took place in 1804-1806 with the Corps of Discovery led by Lewis and Clark. The explorers were searching for a water route across the country. They traveled to the headwaters of the Missouri, crossed the Rocky Mountains, and then traveled on the Columbia River to the Pacific Ocean. Along the way they mapped the terrain and recorded the weather, plants, animals, soil, and minerals they came across. The Corps was also expected to establish friendly relations with all the Indian tribes. The expedition proved there was no water route across the country. The information they gathered along the way spurred the migration west.

Many different types of watercraft traveled on the Missouri River. Canoes, mackinaws, bullboats, keelboats and steamboats traveled the muddy waters. The canoe was used for local trips and for sending mail and freight down the river. Mackinaw boats carried heavy freight downstream. Tribes along the Missouri built small one-person round bullboats. Sometimes a fleet of over one hundred could be seen on the river. Bullboats were often used to transport buffalo meat from a recent hunt downstream.[2] Traders adapted bullboat construction methods and made much larger ones capable of carrying up to 6,000 pounds of furs. A light sapling frame would be covered with a skin of stitched-together bull buffalo hides caulked with fat. Trader bullboats were oval rather than round. They were awkward to handle, leaked, and became waterlogged, but were still useful because they

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[1] Peter and Connie Roop. *River Roads West.* (Honesdale: Calkins Creek, 2007), 37.
[2] Hiriam Martin Chittenden. *History of Early Steamboat Navigation on the Missouri River.* (Minneapolis: Ross & Haines, Inc., 1903), 93-102.

only sat 10 inches low in the water.[3] Traders also used keelboats to haul trade items to the upper Missouri.

Steamboats began traveling the Missouri River in 1819. By 1859, there was more steamboat traffic on the Missouri than the Mississippi. The Missouri River route between St. Louis and Montana could only be traveled during the summer months because ice blocked the upper Missouri for the winter. The first steamboats served the fur trade. The *Yellowstone* was the first steamboat to reach Fort Pierre Chouteau in 1831. Later, boats carried military troops and supplies.

The Missouri was a difficult river to navigate. Strong currents, shallows, submerged trees and other hazards sank many boats. Over 400 steamboats sank on the Missouri during the steamboat era. As more and more railroads built into the territory, steamboats became less important as a means of transportation. When the steamboat fleet was destroyed in the spring of 1881 by high water and ice while docked at Yankton, the industry never recovered.

Overland Trails

Overland trails went where rivers could not. The Oregon Trail crossed the country from Missouri to Oregon in the mid-1800s. Traders, gold seekers, missionaries and settlers streamed west along the trail. The first large wagon train of about 1,000 people traveled the trail in 1843. Ruts formed by the thousands of wagon wheels that crossed the prairies on the trail can still be seen today.[4]

Dakota Territory had its own busy trails. The North Dakota Legislature authorized the Bismarck- to-Deadwood trail as a stagecoach road in 1877. The Northern Pacific Railway stopped at Bismarck then, and gold seekers used the trail to reach the Black Hills. In 1880, the railroad reached Pierre and soon a stage route was established going west. The road from Bismarck was soon abandoned.[5]

Native Americans first used the Fort Pierre-to-Deadwood trail on their trips from the Missouri River to the Black Hills. Fur trappers and the military followed along with gold seekers and settlers.

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[3] Edwin Tunis. *Frontier Living: An Illustrated Guide to Pioneeer Life in America.* (Guilford, CT: Globe Pequot Press, 2000), 109.
[4] National Park Service, U.S. Department of the Interior. The Oregon National Historic Trail website. http://www.nps.gov/oreg/historyculture/index.htm, cited [April 25, 2008]
[5] Christina Sunwall. *Dakota Datebook April 11, 2008 "Bismarck-Deadwood Stage Trail"* Prairie Public Broadcasting, http://www.prairiepublic.org/programs/datebook/bydate/08/0408/041108.jsp, cited [April 25, 2008]

Tons of freight went west on the 200-mile trail. Stagecoaches, wagons, and people on horseback all made the journey. When the railroad moved west, trail use dwindled.[6]

Traveling overland, riding horseback was the quickest way to travel. However, a horse could carry very little cargo besides the rider. Wagons hauled both people and freight. Horses, mules, and oxen could pull the heavy loads. Stagecoaches pulled by teams of four or eight horses traveled faster than wagon trains. Although relatively quick, stagecoach travel was far from comfortable. The body of the stagecoach rested on leather straps that allowed the carriage to rock back and forth rather than jolt up and down. It was like a cradle on wheels. When the trail was too rugged and the stagecoach became stuck in mud or snow, passengers were expected to get out and push. Stagecoaches could carry up to nine people inside. They often hauled as many people as could fit on top, too, as well as everyone's luggage and the mail.

Railroad Travel

The two predominant railroad companies in South Dakota were the Chicago and North Western Railway and the Chicago, Milwaukee & St. Paul (the Milwaukee Road.) The Milwaukee Road had 1,802 miles and the C&NW had 1,305 miles of track. There were other railroad companies such as the Great Northern and the Minneapolis & St. Louis, but they were mainly local lines.[7]

The railroad provided the quickest and easiest way to travel long distances in the late 19th and early 20th centuries. Passenger cars had all the amenities to make the journey comfortable. First class Pullman cars had upholstered seats, carpeted floors and sleeping quarters. The cars had gaslight chandeliers. There were also separate men and women's restrooms. Coach cars had nearly everything the Pullman cars offered except separate sleeping quarters. Instead, the seats reclined so passengers could sleep at night. The least expensive way to travel was on an immigrant car. These offered plain benches and a restroom and stove at one end of the car. Mattresses could be rented to sleep on at night.[8]

Freight traveled in boxcars. The train's caboose started out as a boxcar used as a conductor's car. It also housed other crewmen and tools and supplies. Over the years, the caboose became an important safety feature on trains. The cupola was added to the top of the car as a lookout for other

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[6] Verendrye Museum. *Fort Pierre to Deadwood Trail 2008.*
http://fortpierredeadwoodtrail.com/default.asp?modId=system&logicId=content&viewed=cms&sectionId =18&parentId=0, cited [May 19, 2008]
[7] Charles W. Bohi and H. Roger Grant, "Country Railroad Stations of the Milwaukee Road and the Chicago & Northwestern in South Dakota," *South Dakota History* 9 (Winter 1978): 1.
[8] Explorations in Iowa History Project, University of Northern Iowa, Cedar Falls. *Iowa Railway Guide.* 2003.
http://www.uni.edu/iowahist/Frontier_Life/Railway_Guide/RailwayGuide.htm, cited [May 20, 2008]

trains coming up from behind. Porches were also added on both ends of the caboose for easier movement around the car. Cabooses were usually painted red or yellow so that upcoming trains could easily see them. By the 1980's, the caboose was no longer needed and today they are rarely seen.[9]

Railroads and settlement went hand in hand. Railroads dictated where towns would be placed along the track. Over 400 towns were platted by the railroads as they built into the territory and state. The railroads played an important role in enticing settlers in as well. The rails built into an area before it was settled and then worked hard to bring people in. Without settlers, the railroads knew they would not make money on the rail line.

Passenger service in South Dakota ended in the 1960s. Trains still crisscross the state, but they carry only coal, grain, and other freight.

Improved Roads

George Washington realized how important good roads were for the fledgling United States. He wanted to build a national road to keep the young country united. The best routes followed paths forged by Indian hunters. In 1806, the National Road was approved by President Jefferson – the beginning of government's role in highway construction. The stone road was built by hand along a route from Baltimore, Maryland to Illinois just short of the Mississippi River. The 600-mile road took 33 years to complete.

When Dakota Territory was created in 1861, legislation provided for six roads. In 1868, the first road law went into effect, providing revenue for road upkeep. Citizens could either pay an annual tax of $2.50 or work two days to help maintain the roads.

Early organized roads in South Dakota followed section lines. These were the routes most used by local farmers. Driving in rural South Dakota, particularly east of the Missouri River, one will notice that many roads still follow the section line grid pattern and show up one mile apart. In addition to providing transportation routes, the roads also served as firebreaks.

Improving rural roads became an important issue when rural free mail delivery developed. This service was established in 1896 to deliver mail directly to farm families. Before this service, farmers had to pick up their mail at the nearest post office or pay a private company for delivery. The success of the rural free delivery service depended on the quality of rural roads. The Post Office Department

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[9] American-Rails.com. *The Railroad Caboose: An American Railroad Legend.* http://www.american-rails.com/railroad-caboose.html, cited [May 20, 2008]

had an official policy that rural routes would not be laid out where roads were unfit. This policy put a demand on America for better roads. If they wanted mail delivery, customers had to keep the roads in good condition.[10]

Automobiles became a necessity rather than a luxury during the 1920's. Steel became affordable and available, safety glass was introduced and highway construction was advanced. By 1930, all automobiles had bumpers, gas gauges, gas and oil filters, double taillights and automatic windshield wipers. Balloon tires became standard on many models.[11]

The interstate system, officially called the Dwight D. Eisenhower System of Interstate and Defense Highways, started with the construction of I-70 in Missouri in 1956. It is the most extensive engineering and construction project in the world. President Eisenhower developed the idea for the system while fighting in Europe during World War II. He used the German superhighway, the Autobahn, to reach and defeat the German troops. Eisenhower saw a national highway system as essential for the country's defense during the Cold War. The interstate system would allow for the quick deployment of troops and as an escape route for civilians if needed. The interstate system has 42,795 miles of road. 679 miles of interstate runs through South Dakota on Interstate 29 going north and south and Interstate 90 east and west. Interstate 90 is one of only three interstate highways that run across the entire country. There are 54,663 bridges and 104 tunnels in the interstate system. Interstates all have at least two lanes going in each direction. Each lane is twelve feet wide with a four-foot shoulder and a ten-foot breakdown lane on the left.[12] Interstates are controlled access highways, which mean that not all roads that intersect with the interstate allow traffic to get on or off the highway.

The South Dakota Department of Transportation (SDDOT) was created in 1917 as the South Dakota State Highway Department. The South Dakota Highway Commission was created in 1919. By then, there were more than 100,000 vehicles in the state using the highways.[13]

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[10] Wayne E. Fuller. "Good Roads and Rural Free Delivery of Mail." *The Mississippi Valley Historical Review*. June, 1955.
[11] Harold P. Howard. *Say, Were Those Old Fashioned Cars for Real?* (Stickney, SD: Harold P. Howard, 1973), 109-110.
[12] Dan McNichol. *The Roads that Build America.* (New York: Sterling Publishing Co., 2006), 8-11.
[13] SDDOT Newsletter. Volume 2, Issue 8, July 2007.

Air Travel

In 1903, Wilbur and Orville Wright made the historic first flight. There were others around the country experimenting with their own machines. Glen Curtiss, Alexander Graham Bell and others organized the Aerial Experiment Association. Curtiss set up the Curtiss Exhibition Company in 1910 doing exhibition flying. Exhibition flying quickly came to South Dakota.[14]

Flying started as entertainment rather than a practical means of transportation. Pilots flew airplanes to please the crowds of county fairs and other public events held around the state. Air acrobatics, barnstorming, stunts and staged fights all took place. This 'circus flying' phenomenon was short lived, ending for the most part by 1926.[15]

Commercial aviation began in South Dakota following World War I. One of the first commercial air services was the Huron Aerial Rapid Transit Company. They flew throughout North and South Dakota, Minnesota and Nebraska. The company offered flight instruction, passenger and freight transport as well as entertainment.[16]

Airplanes were quickly pressed into service to deliver mail. Before airmail, the mail could take months to reach its destination. Airmail could deliver letters across the country in a matter of hours. Farming benefited from airplanes, too. Crop dusting helped control weeds and insects in crops. Fertilizing and seeding could also be done from the air. Airplanes and helicopters provide vital emergency services in rural areas, making it possible to reach hospitals much quicker than by road. Wildfires are often fought from the air with planes dropping water, repellent, and smokejumpers.

Flying made the world smaller by shortening the time it took to travel long distances. No longer would it take days or weeks to travel across the country or oceans, but hours. Affordable air service made it possible for people to travel to places and experience different cultures that would have been impossible to reach before.

Transportation in South Dakota has changed greatly over time. Where once stagecoaches jolted along rugged dirt trails, today cars speed along wide interstate highways. The piercing shriek of steamboat whistles no longer sound from the Missouri River. Trains still glide along miles of track, carrying only freight or grain, not passengers. Jet trails stream across the sky as South Dakotans fly to places in hours that once took days or even weeks to reach. What does the future hold for South Dakota transportation?

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[14] Robert Dewey Orr. *A History of Aviation in South Dakota* (Brookings: State University of South Dakota, 1957), 12-15.
[15] Ibid., 81.
[16] Ibid., 86-87.

Photographs

1. Many steamboats traveled up and down the Missouri. The *Alabama*, a 269-ton sternwheeler, hit a snag and sank on October 27, 1870, near Vermillion. More than 400 steamboats sank on the Missouri during the steamboat era.   South Dakota State Archives

2. Snags – dead trees that sank to the bottom of the river – made navigating on the Missouri River dangerous. Hitting a snag could tear the bottom out of a steamboat or a ferry. Snag boats – steamboats fitted with equipment for removing snags – worked to keep the channels clear. The snag boat *Mandan* is shown removing snags by Fort Pierre, ca. 1915.
South Dakota State Archives

3. Before there were bridges across the Missouri, ferries hauled cars back and forth across the river. Here the ferry *Comet* carries vehicles to Pierre, ca. 1915. South Dakota State Archives

4. Ferries carried people, cargo, and vehicles across the river. Here a group travel on the *City of Fort Pierre* ferry, August 24, 1904. Now, there are nine highway bridges spanning the Missouri River in South Dakota. One of them is between Pierre and Fort Pierre. Photo by P. H. Kellogg.
South Dakota State Archives

5. "Bull trains" – wagons pulled by oxen – carried freight overland. Ten teams of oxen are each pulling three wagons. The train had 250 head of oxen and 30 wagons. They traveled from Fort Pierre to Deadwood, a trip of 200 miles. A round trip took a month. They are shown here on September 5, 1885, at Fort Meade. Photo by R. L. Kelly.   South Dakota State Archives

6. Mules hauled goods faster than oxen, but cost more to keep on the road. Pictured here is a mule train on its way from Fort Pierre to the Black Hills in 1885. Photo by R. L. Kelly.
South Dakota State Archives

7. The Medora-Deadwood stage line carried passengers and freight from 1884 to 1886. Stage travel was often crowded and always dusty. Nine people ride on top of the stage driven here by Jas Foley.
South Dakota State Archives

8. One mode of transportation often connected with another. Here the horse-drawn vehicles of the P. J. Schuchart Transfer Line in Pierre haul good back and forth from the Chicago & NorthWestern Railway.   South Dakota State Archives

9. Railroads made it possible for rural residents to travel into town to shop and attend school. The rails moved farmers' crops and other produce to distant markets. Here a Milwaukee Road mainliner crosses Walworth County in 1942.   South Dakota State Archives

10. The Deadwood Central line ran between Lead and Deadwood. The "wavy"section of track was damaged by flood waters along Gold Run Creek in 1889. The track needed repair before the trains could run on it.   South Dakota State Archives

11. In mountainous terrain, trestles made it possible for rail lines to cross each other safely. In Lead, three different rail systems crossed. On the bottom is the Dakota Central line. The middle track carries the Fremont, Elkhorn and Missouri Valley train. A Homestake Mining Company ore train runs along the top track. Lead, 1902.   South Dakota State Archives

12. Passenger trains carried only passengers and their baggage. Mixed trains carried both passengers and freight. In train jargon, a "caterpillar" was a streamlined passenger train. An "express" was a fast train that made few stops. A "milk train" made frequent stops, often in small towns along its route. Here, a train called the *Caterpillar Special* runs from Sioux Falls to Peoria, Illinois in 1937. South Dakota State Archives

13. Bicycles gave people the freedom to move around faster than walking and without depending on an animal. They were fun to ride, too! Here the Morris family enjoys a bicycle outing. Beaulah leads the way, and Gertrude brings up the rear.   South Dakota State Archives

14. A horse-drawn buggy and an early automobile share the road in front of J. W. Parmley's house in Ipswich, South Dakota, 1908.   South Dakota State Archives

15. H. Ernest Beebe drives through a sorghum field on Homewood Farm near Ipswich, 1911. Farm owner Marcus P. Beebe rides along. Having only a rough path for a road did not stop the auto. South Dakota State Archives

16. Townships elected road supervisors to oversee the roads and make sure they were properly graded and maintained. Here the Edgerton Township road in Hanson County is graded, ca. 1908. Township road supervisor Christian Schuttler stands next to the road grader. The grader is being pulled by a steam tractor.   South Dakota State Archives

17. A 2-ton caterpillar spreading gravel on Highway 50 between Platte and Pukwana in 1928. Smoothing the gravel makes a better driving surface.   South Dakota State Archives

18. In the 1920s, "visible" gas pumps filled automobiles. A clear glass tank on top of the pump showed the customer the quality of the gas they were getting as well as the amount. Here, motorists in Dayton, Ohio, use visible pumps to fill their cars in 1923. Pumps with clock face scales replaced the visible pumps and in the 1950s, modern gas pumps with their familiar rolling numbers came along.   South Dakota State Archives

19. Early automobiles often ran into trouble on bad roads. "Horse" power came to the rescue. Here, a horse helps the auto get up a muddy hill.   South Dakota State Archives

20. South Dakota has 83,744 miles of highways, roads and streets. A great many of them are gravel roads. Gravel roads cost less to build and maintain than paved roads. They are good for areas that do not get much traffic.   South Dakota State Archives

21. Weather is hard on South Dakota roads. Extreme heat and freezing cold can both damage paved surfaces. In 1937, J. F. Jacobs examined a large crack in Highway 281.
South Dakota State Archives

22. Some roads run for many miles without a curve in South Dakota's wide-open terrain.
 South Dakota State Archives

23. South Dakota drivers watch for deer, skunks, raccoons, rabbits, and other critters as they drive along. Signs mark some areas where deer are thick, but wise drivers watch for animals on every road.   South Dakota State Archives

24. The Forest City bridge being built over the Missouri River in Dewey County in 1958. One of the largest inland bridges in the United States, the bridge is 4,620 feet long and stands 165 feet above the river bed. Highway 212 runs over the bridge. The bridge was placed on the National Register of Historic Places in 2001.   South Dakota State Archives

25. Nine highway bridges cross the Missouri River in South Dakota. The longest bridge in the state crosses the river on Highway SD 44 between Winner and Platte. Shown here is the bridge on Highway 212 at Forest City in Dewey County.   South Dakota State Archives

26. The official name for the interstate system is the Dwight D. Eisenhower National System of Interstate and Defense Highways. Planned to meet national defense needs, the interstate carries all types of traffic. It is the largest engineering and construction project in the world. There are 679 miles of interstate highway in South Dakota. I29 runs north and south and I90 goes east and west. Shown here is a diamond interchange under construction.   South Dakota State Archives

27. Cloverleaf exchanges like the one shown here allow interstate traffic to flow smoothly because the cars changing directions do not have to stop.   South Dakota State Archives

28. Hyram Rowe pilots a plane for the Ft. Pierre Aeroplane Company with a stuntman on the landing gear at the Wessington Round-up, ca. 1918. Rowe founded the company, which provided entertainment at fairs and other celebrations. The Ft. Pierre Aeroplane Company also flew one of the country's first airmail routes between Pierre and Rapid City and Pierre and Philip.
South Dakota State Archives

29. A North Central Airline jet takes off into clear skies, ca. 1961. Airplanes using jet engines could fly much faster than propeller-driven craft.   South Dakota State Archives

NAME _____

CROSSWORD PUZZLE

WORD LIST

AIRPLANE	INTERSTATE	POSTAL SERVICE	TRAFFIC
AIRPORT	PASSENGER	ROUTE	TRAIL
EXPLORE	PILOT	STEAMBOAT	TRAIN

Down
1. People get their mail through the _____ _____.
2. Many people looked for a water _____ across America.
3. A _____ runs along steel rails laid across planks of wood.
4. The _____ checks the plane's controls before takeoff.
5. Rivers can be dangerous for a _____.
6. People wait at the _____ when they travel by airplane.

Across
7. A _____ needs to find a seat on the train.
8. Many settlers followed the overland _____ to their new homes.
9. The _____ is a large highway that crosses state borders.
10. The _____ makes it possible to travel across the country very quickly.
11. When there are a lot of cars on the road it causes a _____ jam.
12. Lewis and Clark traveled along the river to _____ plant and animal species.

11

NAME _____

CROSSWORD PUZZLE KEY

WORD LIST

AIRPLANE	INTERSTATE	POSTAL SERVICE	TRAFFIC
AIRPORT	PASSENGER	ROUTE	TRAIL
EXPLORE	PILOT	STEAMBOAT	TRAIN

(Crossword grid)

Across the grid:
- 1 (down): POSTAL
- 2 (down): ROUTE
- 3 (down): TRAIN
- 4 (down): PILOT
- 5 (down): STEAMBOAT
- 6 (down): AIRPORT
- 7 (across): PASSENGER
- 8 (across): TRAIL
- 9 (across): INTERSTATE
- 10 (across): AIRPLANE
- 11 (across): TRAFFIC
- 12 (across): EXPLORE

Down

1. People get their mail through the _____ _____.
2. Many people looked for a water _____ across America.
3. A _____ runs along steel rails laid across planks of wood.
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South Dakota Transportation
South Dakota State Historical Society Education Kit

NAME _____

WORD FIND

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D  Q  F  C  W  J  O  L  H  V  M  T  F  R  E  I  G  H  T  U
G  B  T  R  A  N  S  P  O  R  T  A  T  I  O  N  K  A  P  I
C  N  Y  H  S  B  L  U  Z  R  U  O  P  H  Y  E  T  W  S  D
U  A  U  T  O  M  O  B  I  L  E  A  G  D  M  M  B  H  E  P
X  H  R  K  V  F  A  O  M  Y  L  M  C  E  Z  I  R  E  I  G
U  I  C  K  Q  O  F  E  S  N  I  X  B  K  D  S  P  E  D  W
A  G  L  R  N  W  I  K  U  E  E  P  I  C  D  S  I  V  K  F
R  H  N  W  A  L  K  D  I  S  H  Y  C  K  Q  O  S  Y  T  A
A  W  D  I  F  I  O  W  M  E  L  O  Y  C  U  U  N  R  P  H
E  A  C  Y  E  B  L  K  E  F  T  I  C  M  A  R  F  J  D  V
R  Y  S  U  N  H  K  R  C  W  J  C  L  K  E  I  K  T  M  O
O  P  E  M  R  J  A  Y  O  S  V  X  E  W  R  R  J  F  O  Y
N  S  M  A  P  C  E  U  K  A  B  O  Q  B  K  I  L  D  G  A
A  W  E  E  B  K  R  Y  L  E  D  E  P  O  T  V  N  I  K  G
U  T  N  O  H  P  M  E  T  I  W  B  L  M  W  E  Q  S  V  E
T  P  W  A  G  O  N  O  U  C  N  T  D  V  F  R  U  T  J  Z
I  R  C  J  V  N  R  B  R  I  D  G  E  W  K  X  P  A  B  N
C  K  D  Y  U  U  K  F  T  C  N  I  Y  J  O  U  R  N  E  Y
S  A  B  T  E  U  B  O  X  C  A  R  N  C  Z  J  V  C  U  R
H  G  R  D  O  Y  O  T  C  P  R  B  K  D  I  F  U  E  L  J
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WORD LIST

AERONAUTICS	DISTANCE	MISSOURI RIVER
AUTOMOBILE	FLY	RAILROAD
BICYCLE	FREIGHT	SPEED
BRIDGE	FUEL	TRANSPORTATION
BOXCAR	HAULING	TUNNEL
CABOOSE	HIGHWAY	VOYAGE
CAR	JOURNEY	WAGON
DEPOT	MAP	WALK

NAME _____

WORD FIND KEY

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D Q F C W J O L H V M T F R E I G H T U
G B T R A N S P O R T A T I O N K A P I
C N Y H S B L U Z R U O P H Y E T W S D
U A U T O M O B I L E A G D M M B H E P
X H R K V F A O M Y L M C E Z I R E I G
U I C K Q O F E S N I X B K D S P E D W
A G L R N W I K U E E P I C D S I V K F
R H N W A L K D I S H Y C K Q O S Y T A
A W D I F I O W M E L O Y C U U N R P H
E A C Y E B L K E F T I C M A R F J D V
R Y S U N H K R C W J C L K E I K T M O
O P E M R J A Y O S V X E W R R J F O Y
N S M A P C E U K A B O Q B K I L D G A
A W E E B K R Y L E D E P O T V N I K G
U T N O H P M E T I W B L M W E Q S V E
T P W A G O N O U C N T D V F R U T J Z
I R C J V N R B R I D G E W K X P A B N
C K D Y U U K F T C N I Y J O U R N E Y
S A B T E U B O X C A R N C Z J V C U R
H G R D O Y O T C P R B K D I F U E L J
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WORD LIST

AERONAUTICS
AUTOMOBILE
BICYCLE
BRIDGE
BOXCAR
CABOOSE
CAR
DEPOT

DISTANCE
FLY
FREIGHT
FUEL
HAULING
HIGHWAY
JOURNEY
MAP

MISSOURI RIVER
RAILROAD
SPEED
TRANSPORTATION
TUNNEL
VOYAGE
WAGON
WALK

NAME _____

WORD SCRAMBLE

WORD LIST

ENGINE   CONDUCTOR   CABOOSE   NORTHWESTERN
PULLMAN   DEPOT   BOXCAR   BRIDGE

1. A structure enabling a train to go over a river or valley.   D E B I R G

    ____ ____ ____ ____ ____ ____
          1

2. The last car on a train and is usually red.   O B O C E A S

    ____ ____ ____ ____ ____ ____ ____
          2

3. The locomotive of the train; makes the train go.   N E G I E N

    ____ ____ ____ ____ ____ ____
                    3

4. A fancy train car that carried passengers.   L P M L N A U

    ____ ____ ____ ____ ____ ____ ____
                    4

5. The person in charge of the train.   N C U O T D C R O

    ____ ____ ____ ____ ____ ____ ____ ____ ____
                                        5

6. A large train company whose line went through South Dakota.

        N T W S T R E R O H E N

    ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____
          6

7. A train car that did not carry passengers.   C O A R X B

    ____ ____ ____ ____ ____ ____
                    7

8. The building where passengers could buy train tickets.   D T E P O

    ____ ____ ____ ____ ____
     8

The type of transportation that let people in the east get fresh vegetables from the west.

    ____ ____ ____ ____ ____ ____ ____ ____
     1   2   3   4   5   6   7   8

15

NAME _____

WORD SCRAMBLE KEY

WORD LIST

ENGINE	CONDUCTOR	CABOOSE	NORTHWESTERN
PULLMAN	DEPOT	BOXCAR	BRIDGE

9. A structure enabling a train to go over a river or valley.   D E B I R G

    B   R   I   D   G   E
        1

10. The last car on a train and is usually red.   O B O C E A S

    C   A   B   O   O   S   E
        2

11. The locomotive of the train; makes the train go.   N E G I E N

    E   N   G   I   N   E
            3

12. A fancy train car that carried passengers.   L P M L N A U

    P   U   L   L   M   A   N
            4

13. The person in charge of the train.   N C U O T D C R O

    C   O   N   D   U   C   T   O   R
                            5

14. A large train company whose line went through South Dakota.

        N T W S T R E R O H E N

    N   O   R   T   H   W   E   S   T   E   R   N
        6

15. A train car that did not carry passengers.   C O A R X B

    B   O   X   C   A   R
                7

16. The building where passengers could buy train tickets.   D T E P O

    D   E   P   O   T
    8

The type of transportation that let people in the east get fresh vegetables from the west.

    R   A   I   L   R   O   A   D
    1   2   3   4   5   6   7   8

Learning from Objects

Objectives:
- Participants will examine objects.
- Participants will draw conclusions based on direct observation.
- Participants will recognize that much information can be acquired about an object from direct observation.

South Dakota Social Studies Standards

K	1st	2nd	3rd	4th	5th	6th
K.E.1.2		2.US.1.2 2.US.2.1 2.E.1.1	3.E.1.1	4.W.2.1		6.E.1.1

South Dakota Communication Arts Standards

K	1st	2nd	3rd	4th	5th	6th
K.LVS.1.2 K.LVS.1.6	1.LVS.1.2 1.LVS.1.6	2.LVS.1.2 2.LVS.1.4 2.LVS.1.5 2.LVS.1.6	3.LVS.1.1 3.LVS.1.2 3.LVS.1.3 3.LVS.1.4	4.LVS.1.1 4.LVS.1.3	5.LVS.1.1 5.LVS.1.2 5.LVS.1.3	6.LVS.1.2 6.LVS.1.3

South Dakota Science Standards

K	1st	2nd	3rd	4th	5th	6th
K.P.1.1		2.P.1.1	3.P.1.1 3.E.1.2			

Timeframe: 30-60 minutes

Materials:
Included in kit
All objects
Object Identification Sheet

Why Learn from Objects?
There are many way to learn about the world. One way is to listen and hear information – auditory learning. Another way to get information is by reading, watching a TV or video program, or looking at photographs – visual learning. This kit lets participants learn in another important way – by handling three-dimensional objects. This develops kinesthetic skills, or learning by touch. Participants can see physically how objects are alike and how they are different. They can consider what use an object may have – is it a stand-in for something, like a live animal or a physical place? Is it an object that was made or used by people from a different culture? The kit's written information, photographs and three-dimensional objects allow participants to practice all three learning styles.

17

Activity Steps:
1. Arrange the participants so that it is easy to pass objects from one to another. Pass the objects around one at a time, allowing the participants to handle and examine them.
2. While the participants are examining the objects, use the points below to start discussion about the materials, construction and history of the objects. Encourage the participants to share the visual and tactile information they get from the objects. You may ask each participant to consider a different aspect of the object-history, material, etc. Have the participants respond so the entire group can hear and enter into the discussion.
3. After an object has been examined, share the information found on the Object Identification Sheet with the group.

Materials & Construction:
- What material is the object made out of? (wood, paper, plastic, rubber, metal, fabric, feathers, straw)
      -Is the material made by man or by nature?
      -If it is natural, has it been changed by people? (carved, cast, molded, glued, sewed)
- Is the object sturdy or fragile?
- Is the object light or heavy?
- Is the object hard or soft?
- How would you describe the texture of the surface of the object?

History & Function:
- What might be the purpose of the object?
      - Why might it be included in the kit? What might the object be trying to show?
- Does the object look or feel like something from long ago, or is it something from recent times?
- Is this object still used today?
- What has changed about the object today?
- Was the object used for a special task or occasion or was it an everyday item?
- What questions do you have about the object?
- Where could you find the answers to your questions?

Object Identification List

(kit 1)

T-2008-032
> **Wagon model.** Horse-drawn wagons hauled people and goods all over Dakota – with horses providing the "horsepower." James Watt, a steam engine inventor from the 18th century, invented the term horsepower. Watt measured the amount of work a horse could do in a certain time. He used the measurement to estimate how many horses his steam engine could replace. A six-horsepower engine could do the work of six horses.

T-2008-017
> **Bit.** Horseback riding was an important way to travel in early South Dakota. Today, people ride for pleasure, work and as a way to get around. The rider must be able to control the horse. The bit on a bridle goes into the horse's mouth and attaches to the reins. By moving the reins, the rider lets the horse know what to do.

T-2008-016
> **Stirrup.** Another important piece of horse tack, the stirrup is attached to the saddle. Stirrups give riders more stability on the animal's back and provide an easier way to mount and dismount.

T-2008-012
> **Bridle.** The bridle fits over the horse's head so the horse can be controlled. This heavy bridle has blinders, the flat eyepieces that limit how far to the side the horse can see. Blinders keep the horse from becoming distracted by movement around or behind it.

T-2008-023, T-2008-024
> **Horseshoes.** These flat metal plates are attached to a horse's hooves to protect them. Draft horses can wear specially designed shoes that increase their traction and stability. Horseshoes need to be regularly removed, inspected, and replaced. A *farrier* does this job.

T-2008-57
> **Steamboat plate.** With their billowing smokestacks and churning paddlewheels, steamboats inspired artists and writers. Mark Twain wrote many stories about his experiences piloting a steamboat. The steamboat decoration on this plate brought the romance and adventure of river travel to the dinner table.

T-2008-021
> **Railroad spike.** Metal spikes fasten the railroad track to the wooden ties. The spikes have an L-shaped head, square shank, and wedge-shaped tip. Driving the spike into the tie across the grain gives it great holding power.

T-2008-039
> **Train whistle.** This toy train whistle sounds much like the whistle on an old-fashioned locomotive. Combinations of long and short whistle blasts signaled different train actions. One long blast meant approaching a station. Two long, one short, and one long blast meant the train was coming to a railroad crossing. Repeated short blasts indicated an emergency.

T-2008-036
Pocket watch. In 1891, a train engineer's watch stopped for four minutes and then started again. The watch's failure put the train off schedule and resulted in a wreck that killed nine people in Ohio. Following the disaster, railroad watches had to meet tough new standards. They had to be accurate within 30 seconds each week, have a white face with black Arabic numbers, and stay accurate in hot and cold weather. Engineers had their watches inspected regularly. With trains moving both directions on the same track, being on time was a matter of life or death. This pocket watch is not an official railroad watch, but does have many of the same features.

T-2008-052
Northern Pacific timetable. Trains ran on a tight schedule. Printed timetables let passengers know exactly when the train would arrive and depart from their town.

T-2008-053
Milwaukee Road brochure. Railroads worked hard to make sure their passengers were comfortable and enjoyed their journey. This brochure informed travelers riding the Milwaukee Road train to the west coast of the United States about the countryside and the towns they passed.

T-2008-073
Railroad map. This 1910 map of South Dakota railroads shows how many rail lines existed in the state. Passenger service in the state peaked in 1920, and ended completely in the 1960s. Trains still haul grain and coal through the state.

T-2008-059, T-2008-060
Car models. Car designs have changed much over time. Early cars looked much like the horse-drawn buggies they replaced. Later car models had a sleeker, more streamlined look. Compare these early car models to the cars you see driving on the roads today. How are they different?

T-2008-063
Gas pump. In the 1920s, "visible" gas pumps had a clear glass tank on top that showed customers the quality and amount of gas they were pumping. In the 1950s, modern gas pumps with rolling numbers showing gallons and price came along.

T-2008-043
License plates. In South Dakota, passenger vehicles must have both front and rear license plates. The first one or two digits on the plate represent the county where the plate was issued. These plates are from Roberts County.

T-2008-014
Battery tester. Keeping an automobile on the road requires regular maintenance. Drivers can take their vehicles to mechanics for tuneups or do the job themselves. Checking the battery to make sure it is charging and holding a charge properly is an important part of a tuneup.

T-2008-008
       Tire pump. Bad roads were hard on car tires. Carrying a tire pump and knowing how to fix a flat were important skills for early motorists. By standing the pump upright, attaching the hose to the fixed flat, and pumping the handle up and down, air filled the tire and the motorist could continue on their journey.

T-2008-010
       Tire iron. Getting a tire off a car requires using a tire iron. The tire iron is used to loosen the nuts holding the tire in place and tighten the nuts when the tire is replaced. This is an L-shaped iron.

T-2008-041
       Tube repair kit. Flat tires were common on early roads. Smart motorists carried the tools and equipment they needed to fix tires on the road. A compact tire repair kit like this one kept the tires rolling.

T-2008-034
       Auto flare*.* Auto flares were set out to warn other drivers about problems. The red light on top of this battery-operated flare and the red reflectors on its side let approaching drivers know to approach with caution. Emergency flashers are standard equipment on cars now. Setting out reflective orange triangles also warns other drivers about problems on the road.

T-2008-069, T-2008-071
       Hatbox with pheasant feather hat. Ladies traveling by automobile, train, or steamboat needed a handy way to carry their fancy hats. Hatboxes – round containers with attached carrying cords – filled the bill. Hatboxes could be plain or very fancy. This floral hatbox holds a South Dakota specialty – a lady's hat decorated with pheasant feathers! (NOTE: The feathers are fragile, so handle the hat carefully.)

T-2008-019
       Dashboard compass. Before cars had global positioning systems and computers, dashboard compasses provided information. The compass did not tell motorists what road they were on, but it did let them know which direction they were going. Watching the compass turn as the car turned was fun, too.

T-2008-050
       SD Driver's License Manual. Drivers must pass a test that shows they know the rules of the road and how to operate a vehicle safely before they are issued a driver's license. This manual helps people prepare for the South Dakota driver's exam.

T-2008-076, 077, 078, 079, 080, 081
       SD Highway maps. Highway maps show the vast number of roads that crisscross South Dakota. Drivers in the state use multi-lane interstate highways and small gravel roads.

T-2008-004
   Concrete pavement sample. Concrete pavement like this is used to pave South Dakota highways. Concrete has three ingredients – portland cement, water, and *aggregate*. Aggregates are the rocks or sand in the mixture. Can you see the aggregate in this sample?

T-2008-006
   Asphalt pavement sample. Thousands of miles of South Dakota highway are paved with the black, sticky stuff called asphalt. Very soft when it is first applied, when it hardens the asphalt makes a hard, but flexible, driving surface.

T-2008-067
   Stop sign. Drivers depend on road signs to help them find their way and drive safely. Signs are highly reflective so they will be easy to see in bad weather and at night.

T-2008-065
   Railroad crossing sign. It is vital for drivers to know when they are crossing a railroad track – cars and train never mix well! Some railroad crossings are marked with crossbar signs, flashing lights, and gates blocking the road. In areas with less traffic, drivers know they are going to cross tracks when they see this yellow sign with its black X.

T-2008-038
   Northwest 757 airplane model. Propellers provided early airplanes with the thrust needed to push them through the air. Jet engines replaced propellers. Jets were much more powerful so planes could be build bigger and fly faster. The Northwest 757 used jet engines.

T-2008-048, T-2008-046
   Airline safety cards. Airline passengers need to know about the seat belts, overhead call lights, and emergency oxygen masks on their airplane. Flight attendants show how the equipment works and explain what to do in an emergency at the beginning of every flight. Safety cards with emergency information are found in the plane's seat pockets.

 T-2008-055
   Continental Airlines cup. Riding an airplane was once an elegant and expensive way to travel. Airlines served their passengers food and drink with china featuring the airline logo.

T-2008-029
   American Airlines playing cards. Airlines wanted people flying on their airplanes to be comfortable and happy. Bored flyers could get a deck of cards to amuse themselves in-flight – and they could keep the cards, too.

Steamboat Parts

Objectives:
- Participants will identify nine parts of a steamboat
- Participants will recognize the function of each part
- Participants will explain the role steamboats played in South Dakota transportation

South Dakota Social Studies Standards

K	1st	2nd	3rd	4th	5th	6th
		2.US.1.2	3.W.1.1	4.US.1.1		6.E.1.1

South Dakota Science Standards

K	1st	2nd	3rd	4th	5th	6th
K.P.1.1		2.P.2.1			5.S.1.1	6.S.1.1

South Dakota Communication Arts Standards

K	1st	2nd	3rd	4th	5th	6th
K.LVS.1.1 K.LVS.1.2 K.LVS.1.6	1.LVS.1.2 1.LVS.1.6	2.W.2.4 2.LVS.1.2 2.LVS.1.6	3.LVS.1.1 3.LVS.1.2	4.LVS.1.1 4.LVS.1.2	5.LVS.1.1	

Timeframe: 30-45 minutes

Materials:

Included in education kit	Provided by instructor or participants
- Steamboat Parts worksheet master	- Paper - Pen or pencil - Crayons, colored pencils or markers

Background information:

The *Yellowstone* was the first steamboat to travel on the Missouri River in South Dakota, traveling to Fort Pierre Chouteau in 1831. Steamboats hauled supplies for the fur traders and settlers. The steamboats carried building supplies, grain, coal, mail, and passengers. River traffic reached its peak between 1870 and 1880. Many of the boats were tied up at Yankton for the winter in 1880-81. When the river thawed that year, ice and high water badly damaged the fleet. The river trade never recovered. By then, too, railroads had built into Dakota and took away much of the steamboat's trade. Steamboats offered one of the quickest and easiest methods of travel in Dakota Territory before railroads. In this activity, participants will identify nine parts of a steamboat and recognize what each part does.

Cargo area – Cargo on the steamship went on the lower level between the engine and the boilers.
Boilers – Tanks where water was heated and turned into steam to power the steamboat. They were near the front of the ship.
Engine – Burning wood or coal heated the water in the boilers and turned it into steam. The steam powered the engine which turned the paddlewheel. The engine was located in the back of the ship near the paddlewheel.

Paddlewheel – Located on the back of the ship, the turning wheel moved the steamship forward or backward. Paddlewheels could be as large as 18 to 20 feet in diameter.

Smokestack – Smokestacks carried the smoke from the burning wood or coal away from the ship. They were tall to keep the smoke off the ship, and to create a strong draft that pulled air into the furnace and made it burn the wood or coal better.

Hull – The submerged bottom of the steamboat. Wooden hulls were strong, but being in the water all the time caused them to rot. Hitting a snag or submerged tree could punch a hole in the hull.

Cabins – Passengers booked cabins on the steamboat's second level for their journey. Located above the boiler and engine, and over any livestock being carried as cargo, steamboat cabins must have been noisy!

Texas – The captain and ship's officers had their quarters on the top deck or "Texas". One possible explanation for calling it the "Texas" deck was that early steamboats had only two decks – one for passengers and one for cargo. The third deck on top, with its officers' quarters, was called the "Texas" because it was an addition to the original boat – much like Texas was an addition to the Union.

Wheelhouse – The wheelhouse held the large wheel that steered the ship. Found on the very top of the steamboat, from the wheelhouse the pilot could keep a sharp eye for snags, shallows, and other hazards. Cords and levers in the wheelhouse rang bells down below in the engine room to let crewmen know what the pilot wanted – to move ahead, reverse, or stop.

Activity steps:
1. Give each participant a copy of the Steamboat Parts worksheet.
2. Share the background information with the group and discuss:
   - What did steamboats carry in Dakota Territory?
   - When did they operate?
   - What happened to the steamboats?
   - What mode of transportation replaced them?
3. As you discuss each of the steamboat parts, have participants label the part on their worksheet.
4. Participants can color their worksheet.

Name _____

Steamboat Parts

Paddle wheel   Hull   Wheelhouse   Texas

Engine   Cargo area   Cabins   Smoke stack

Boilers

Name _____

Steamboat Parts Key

Paddlewheel   Hull   Boilers   Wheelhouse   Texas

Engine   Cargo area   Cabins   Smoke stack

1 **smokestack**

2 **boilers**

3 **cargo area**

4 **hull**

5 **engine**

6

cabins

7

paddlewheel

8

Texas

9

Wheelhouse
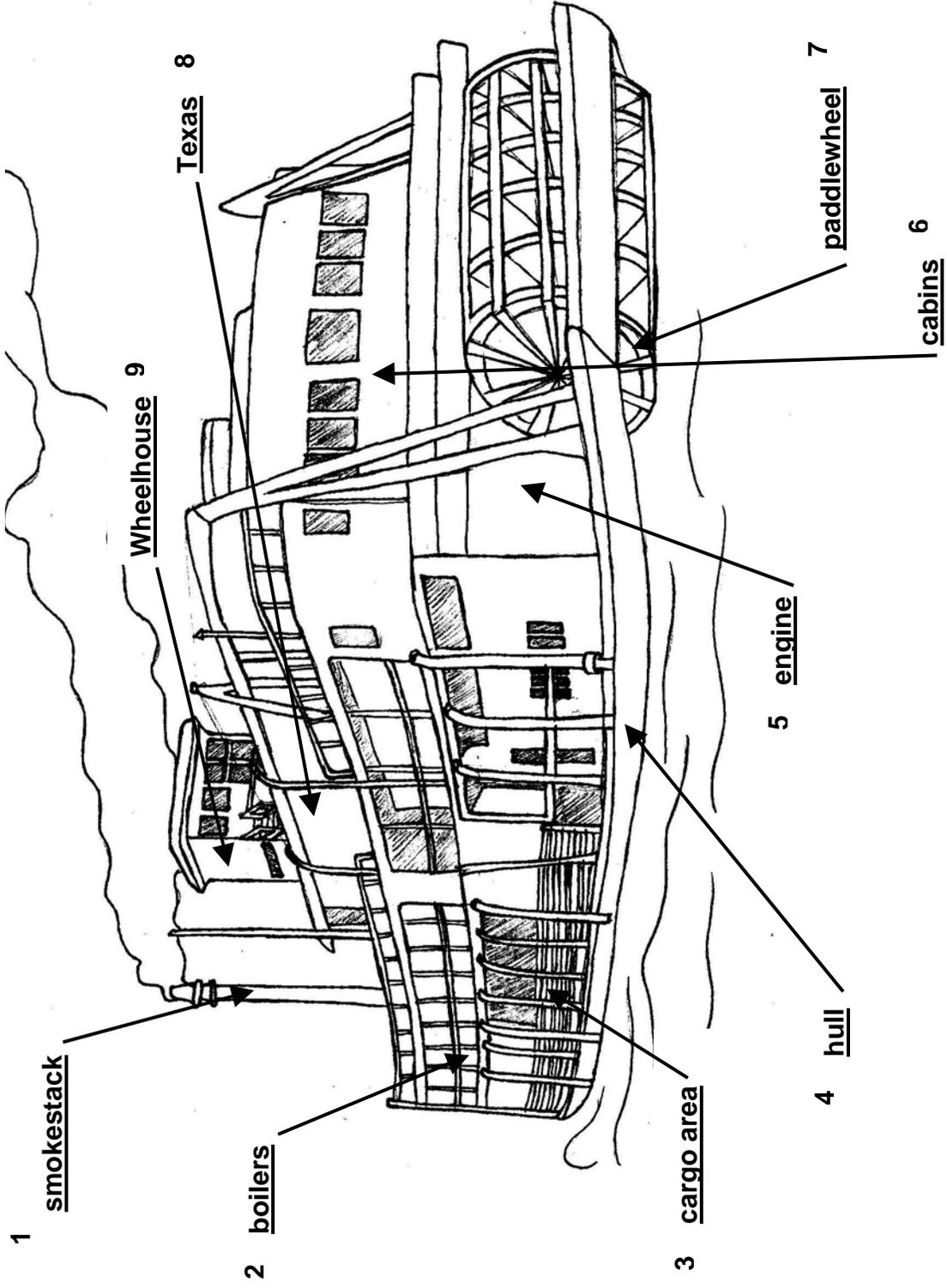
Build a Bull Boat

Objectives:
- Participants will identify three river transportation vessels.
- Participants will construct a bull boat model.
- Participants will experiment to discover how much weight their bull boat can carry.

South Dakota Math Standards

K	1st	2nd	3rd	4th	5th	6th
K.G.1.1￼ K.N.1.1￼ K.N.1.2	1.G.1.1			4.G.2.1		

South Dakota Social Studies Standards

K	1st	2nd	3rd	4th	5th	6th
		2.US.1.2￼ 2.E.1.1	3.US.1.1￼ 3.W.1.1￼ 3.E.1.1	4.US.1.1￼ 4.G.2.1￼ 4.E.1.1	5.E.1.1	6.E.1.1

South Dakota Science Standards

K	1st	2nd	3rd	4th	5th	6th
	1.P.1.3		3.E.1.2	4.S.1.1￼ 4.S.1.2	5.P.2.1￼ 5.S.1.1￼ 5.S.1.2	

South Dakota Communication Arts Standards

K	1st	2nd	3rd	4th	5th	6th
K.LVS.1.2￼ K.LVS.1.6	1.LVS.1.2￼ 1.LVS.1.6	2.LVS.1.2￼ 2.LVS.1.6				

Timeframe: 45-60 minutes

Materials:

Included in kit	Provided by instructor or participants
- Steamboat china plate￼ - Photos 1, 2, 3, 4￼ - Bull Boat Instructions master	- 6 pipe cleaners for each bull boat￼ - 8" piece of aluminum foil for each boat￼ - Pennies or other weights￼ - Bucket of water

Background information:

Long before roads, the Missouri River served as a travel route in South Dakota. Native Americans, fur traders, soldiers, and settlers traveled up and down by bullboat, canoe, keelboat, and steamboat. Ferries carried people, animals and goods across the river at different points.
The Missouri's swirling waters were full of dangers – snags, sandbars, strong currents, and shallows. The river was shallow much of the year, and shifted constantly. One riverbank would erode and the opposite bank would build up, moving the river channel. Ice presented another danger. In 1881, steamboats tied up at Yankton for the winter were smashed by ice flowing down the river. When the water eroded the shoreline and trees fell in, they sank to the bottom and became dangerous snags.

The Mandan and other tribes made bullboats by stretching a bull buffalo hide over a frame of willow branches. The boats moved easily and quietly through the water. Fur traders used bullboats to transport furs. Taking the bullboat out of the water every day or two and drying it out made the boat last longer. In this activity, participants will make a model bullboat and experiment to find out how much weight the boat can hold.

Activity Steps:
1. This activity can be done individually, working in pairs, or small groups. Pass around the steamboat china, and the two photographs. Share the background information with the group. Have them verbally identify three different kinds of river vessel. (bullboat, keelboat, ferry, canoe, steamboat).
2. Give each participants, pair or group 6 pipe cleaners and a square of aluminum foil and a copy of the Bull Boat instructions. Have them construct a boat.
3. Once the boats are built, gather as a group and take turns floating each boat in the bucket of water. Add pennies or other weights (marbles, pebbles, etc.) to the floating boat. Track of how much weight each boat holds before tearing or sinking.
4. Discuss:
   - What types of vessels were used on the Missouri?
   - Who used bull boats?
   - What were bull boats made from?

Bull Boat Instructions

1. Cut one pipe cleaner in half. Form one half into a 1.5" diameter circle
2. Form one pipe cleaner into a 2.5" circle
3. Form one pipe cleaner into a 3.5" circle.
4. Lay the 1.5" circle in the middle of one pipe cleaner. Attach the pipe cleaner by twisting it onto the circle. Do the same with the other two pipe cleaners.
5. Moving about 1" up the attaching pipe cleaners, attach the 2.5" circle.
6. Move another inch up the attaching pipe cleaners and twist on the largest 3.5" circle.
7. Lay the frame in the center of the aluminum foil square and fold the foil over the frame.

Make a 1.5" circle from ½ of a pipe cleaner

Make a 2.5" circle from one pipe cleaner

Make a 3.5" circle from one pipe cleaner

Twist the three attaching pipe cleaners onto the small circle

twist

Twist on the middle-size circle

Twist on the large circle

Fold aluminum foil over the pipe cleaner frame
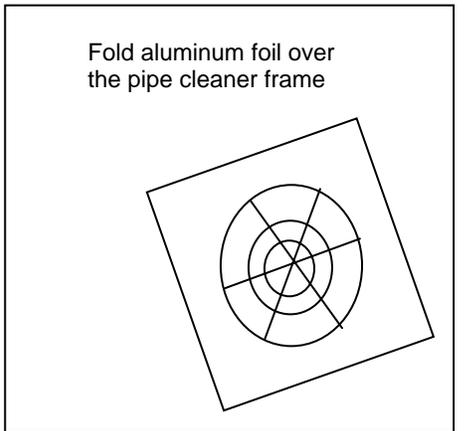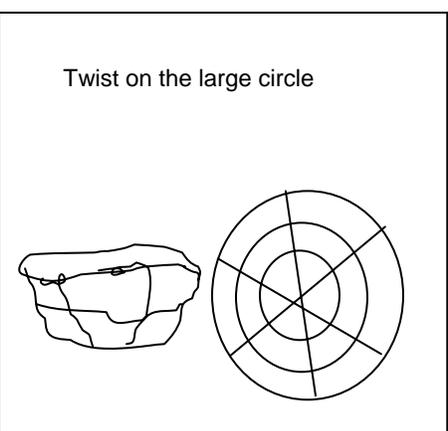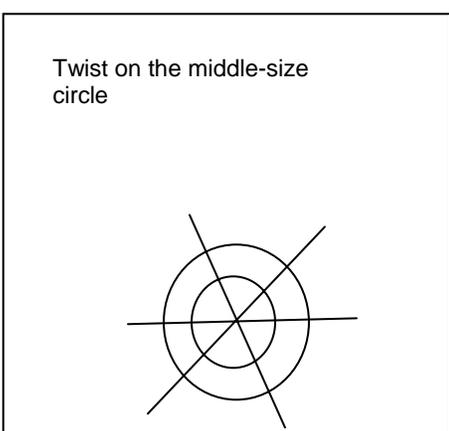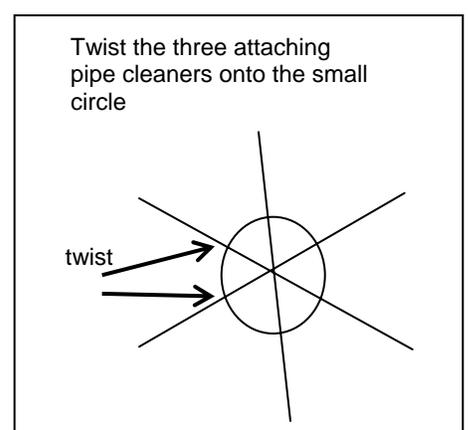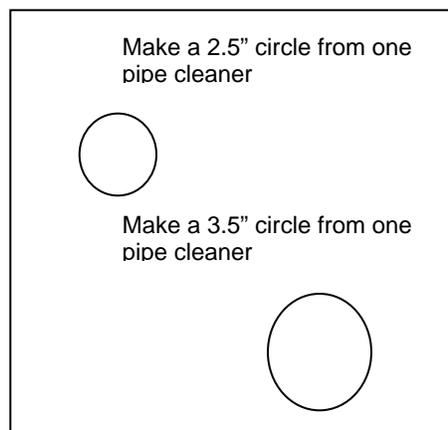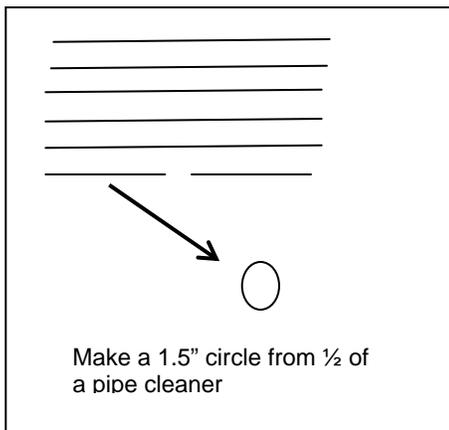
Dining in Style: Railroad & Airline China
Design a Logo

Objectives:
- Participants will identify two airline logos.
- Participants will analyze elements used in transportation logos to determine the message the logos send.
- Participants will design their own transportation company logo.

South Dakota Social Studies Standards

K	1st	2nd	3rd	4th	5th	6th
	1.E.1.1.		3.E.1.2.			

South Dakota Communication Arts Standards

K	1st	2nd	3rd	4th	5th	6th
K.R.3.1 K.W.1.1 K.LVS.1.2 K.LVS.1.5 K.LVS.1.6	1.W.1.1 1.W.1.2 1.LVS.1.1 1.LVS.1.2 1.LVS.1.5	2.R.5.1 2.LVS.1.1 2.LVS.1.2	3.LVS.1.1 3.LVS.1.2 3.LVS.1.3 3.LVS.1.4	4.R.3.3 4.LVS.1.1 4.LVS.1.3 4.LVS.1.5	5.LVS.1.1 5.LVS.1.2	6.R.2.1 6.LVS.1.1 6.LVS.1.3

South Dakota Visual Art Standards

	K	1	2	3	4	5	6
Std. 1: Visual arts as communication	X	X	X	X	X	X	X
Std. 3: Visual arts in relation to history, culture, and society	X	X	X	X	X		
Std. 4: Visual arts as critical response				X	X	X	X

Timeframe: 30-45 minutes

Materials:

Included in kit	Provided by instructor or participants
- Eastern Airlines mug OR Northwest plane model (only 1 in the kit) - Continental Airlines cup - Railroad timetables	- Crayons, colored pencils, markers or paint - Paper plates

Background information:

Companies use logos, easily recognized images, to help people remember their company products. Railroads and airlines were transportation companies that designed and used logos. They put their logos on promotional materials and on the dishes they used on their trains and airplanes.

Seeing the logo could remind people of the company – and of the good service the company gave them.

Railroads and airlines were once very luxurious modes of travel. Railroads served elegant meals using china and silver in their dining cars. Airlines offered coffee and good meals to their flying customers. Both railroads and airlines used their logos in advertisements, too. In this activity, participants will design a logo for their own transportation company.

Activity steps:
1. Work either as individuals or in small groups. Give each participant a paper plate.
2. Pass around and examine the airline cups and the railroad timetables. Look for the railroad logo on the timetables. Discuss:
   - What feeling is each company trying to express in its logo? Speed? Comfort? Stability?
   - What other company logos are participants familiar with? Examples could be soft drinks, athletic shoes, clothing companies.
3. Have participants imagine they run a transportation company. It can be a travel company from the past, present, or future. They could run a stagecoach company, railroad, airline – or spaceship or undersea submarine company! To get people interested in their service, and to help people remember the company, the participant has to design a logo for their firm. What "image" will people remember about their transportation company?
4. Have participants design their logo and put it on their paper plate "china."
5. Gather as a large group and have participants do a "sales pitch" for their company. What does the company offer? Does their logo get their message across to their potential customers?

Loading an Immigrant Car

Objectives:
- Participants will explain what an immigrant car is and its function.
- Participants will choose items to pack into an immigrant car.
- Participants will create a packed immigrant car art project.

South Dakota Social Studies Standards

K	1st	2nd	3rd	4th	5th	6th
K.E.1.2	1.E.1.2	2.US.1.2	3.W.1.1			

South Dakota Communication Arts Standards

K	1st	2nd	3rd	4th	5th	6th
K.LVS.1.1 K.LVS.1.2	1.LVS.1.2					

South Dakota Visual Art Standards

	K	1	2	3	4	5	6
Std. 1: Visual arts as communication	X	X	X	X	X	X	X
Std. 3: Visual arts in relation to history, culture, and society	X	X	X	X	X	X	X

Timeframe: 60-90 minutes

Materials:

Included in kit	Provided by instructor or participants
▪ 6 Loading an Immigrant Car coloring sheets	▪ Crayons ▪ Large sheet of construction paper ▪ Glue ▪ Scissors

Background Information:

Thousands of settlers moved to Dakota in the late 1800s. Many of them came in by train. Railroads hauled in peoples' goods and livestock – and sometimes the people, too – in boxcars called immigrant cars. Each family would pack their belongings from the dishes in the cupboard to the barn cat into the car for the trip. One car carried lumber and nails for a claim shanty, china dishes, tools, a wagon, a walking plow, a team of horses, a flock of ducks, 7 cows, 25 chickens, and 2 cats. The teenage son riding in the packed car for the 10-day trip considered it "crowded and stuffy."

The immigrant cars could not always hold everything a family owned and they had to make hard choices about what to leave behind. Some things could be purchased once they reached

Dakota. In this activity, participants will decide which items they will pack into their immigrant car from the goods on the coloring sheets. They will create their own immigrant car art project.

Activity Steps:
1. Share the background information with the group.
2. The activity can be done individually or working in small groups. Give each participant or group a copy of the six coloring sheets and a large sheet of construction paper. The construction paper will be their immigrant car.
3. Have participants color and cut out the items on the coloring sheets. Once the items are colored and cut out, participants need to choose which items they will pack into their car. Consider:
   *   Which items are necessary?
   *   Are there items that can be replaced easily in Dakota?
4. Have participants draw a railroad boxcar on the construction paper. They can glue the goods they have chosen to take into their car.
5. Create your own immigrant train by hanging the immigrant cars in a line.

# Loading an Immigrant Car
Coloring Sheet 1
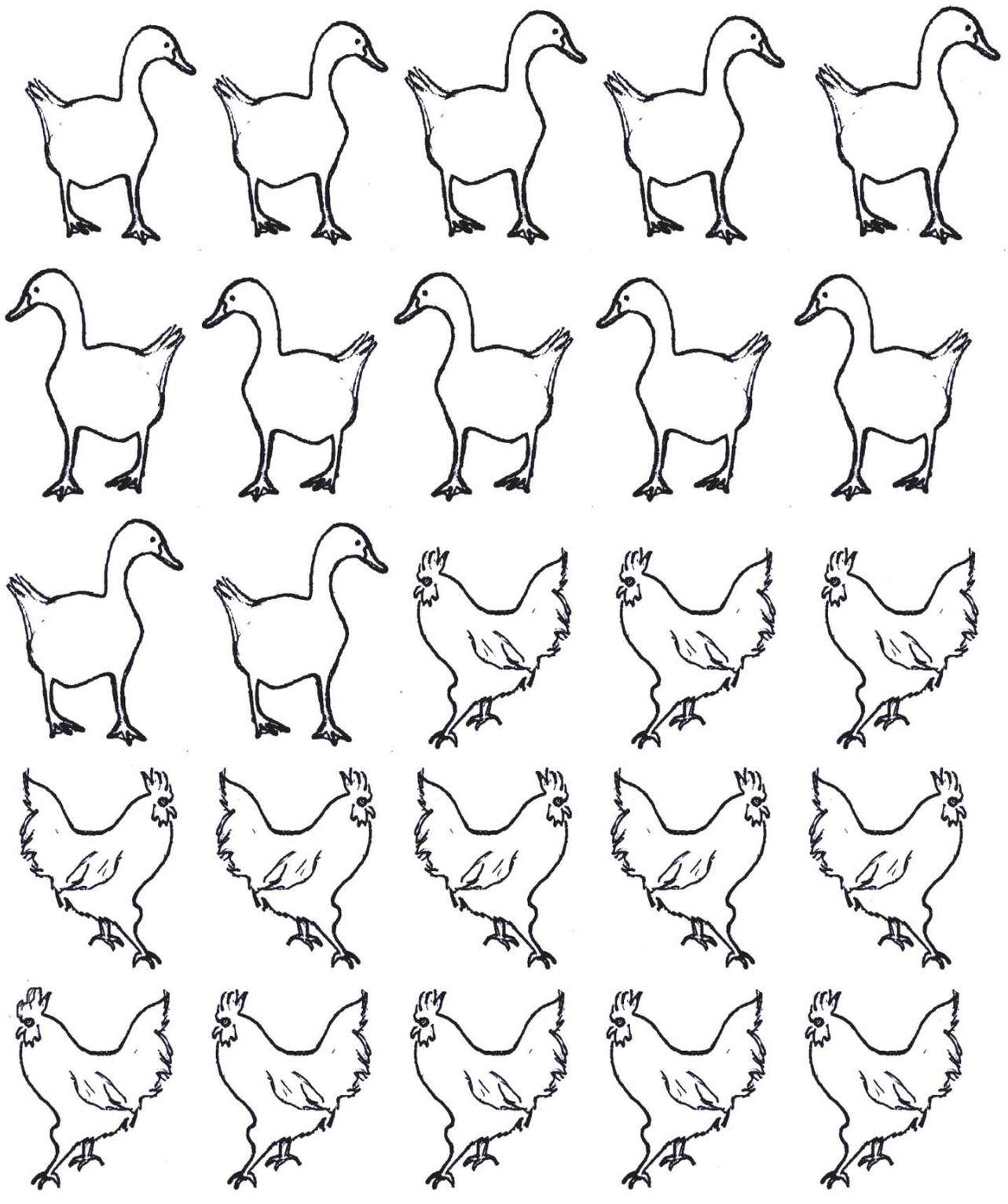
Loading an Immigrant Car
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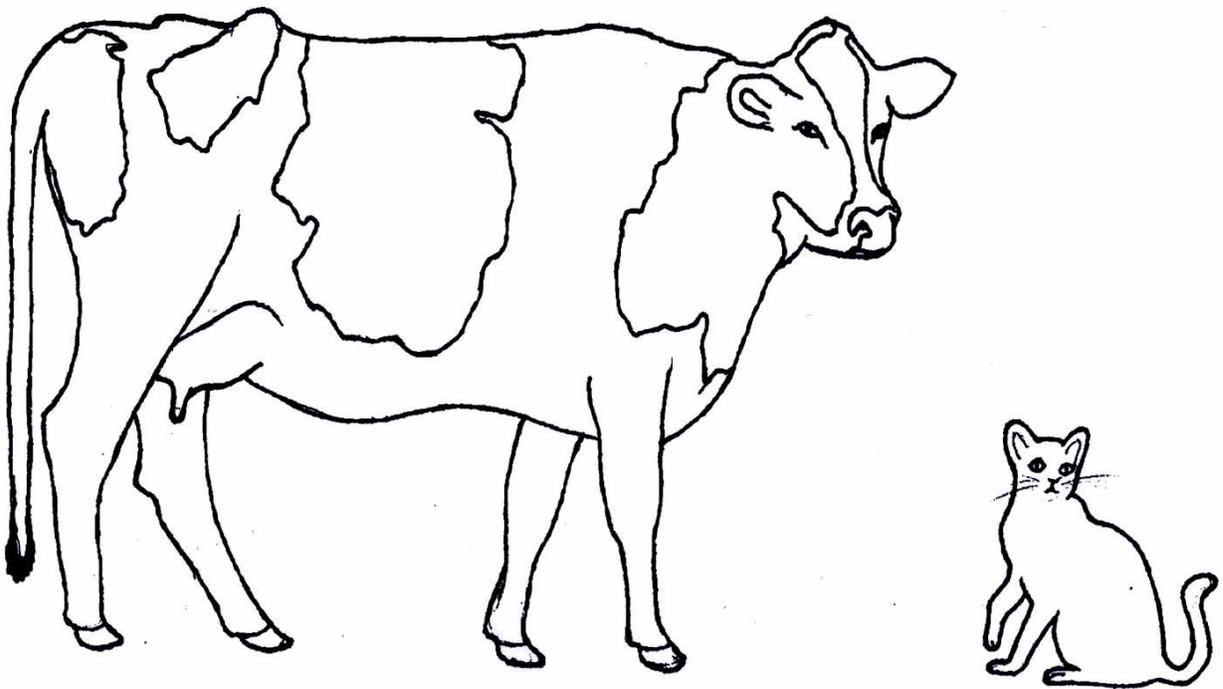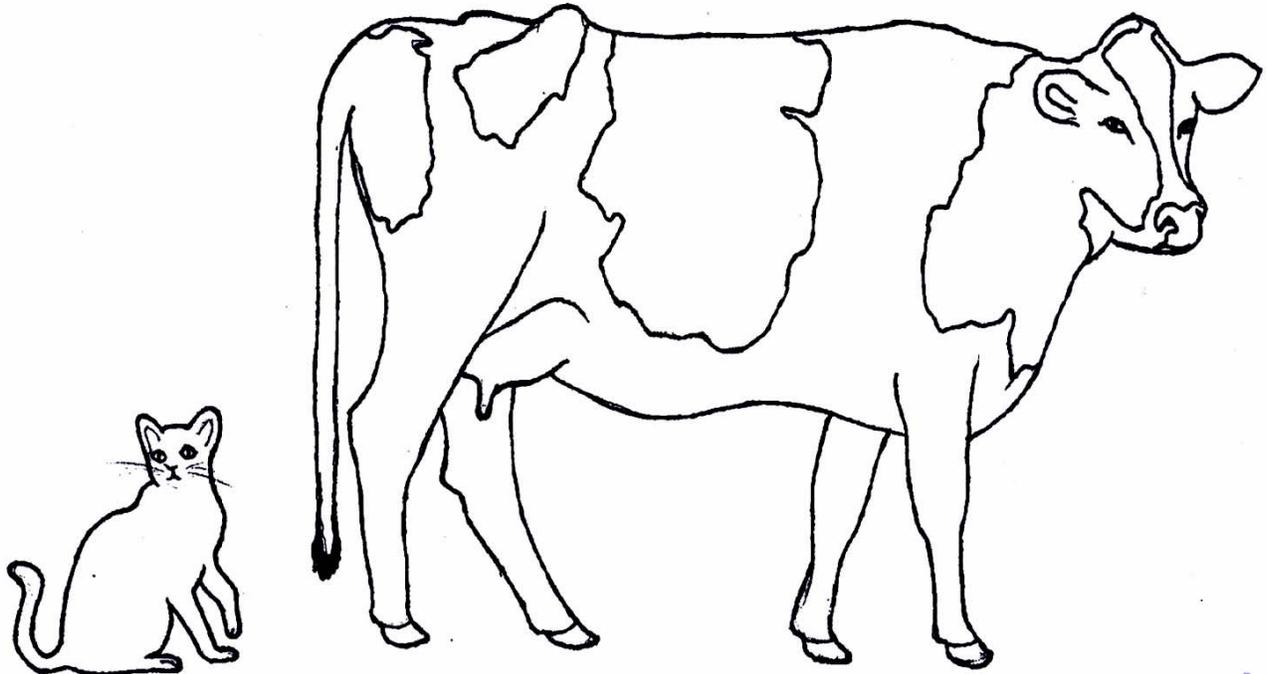
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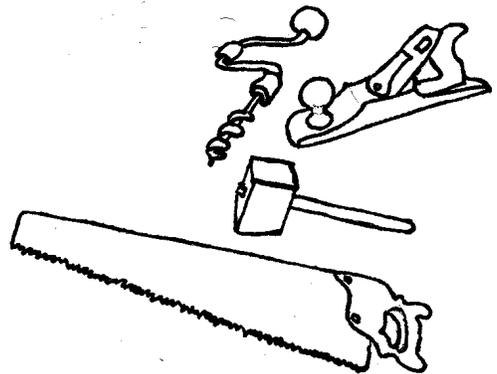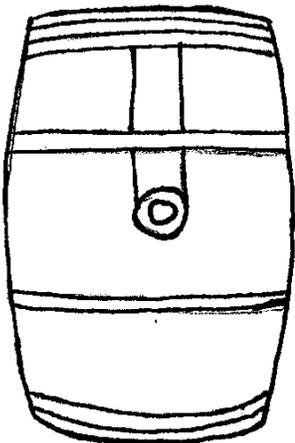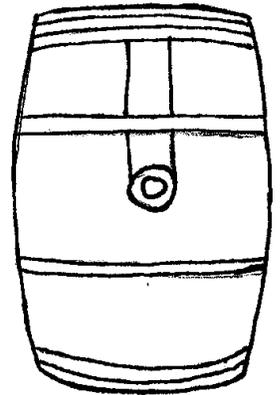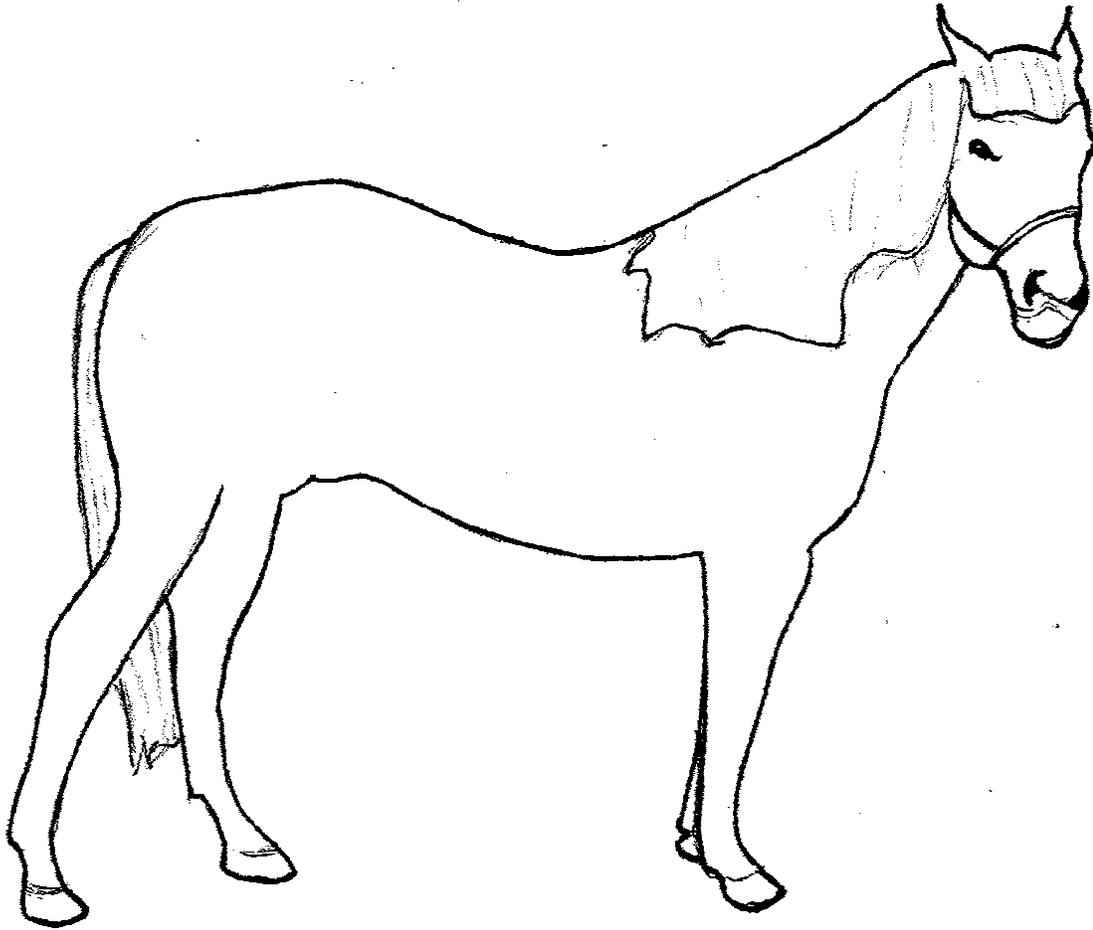
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Coloring Sheet 4
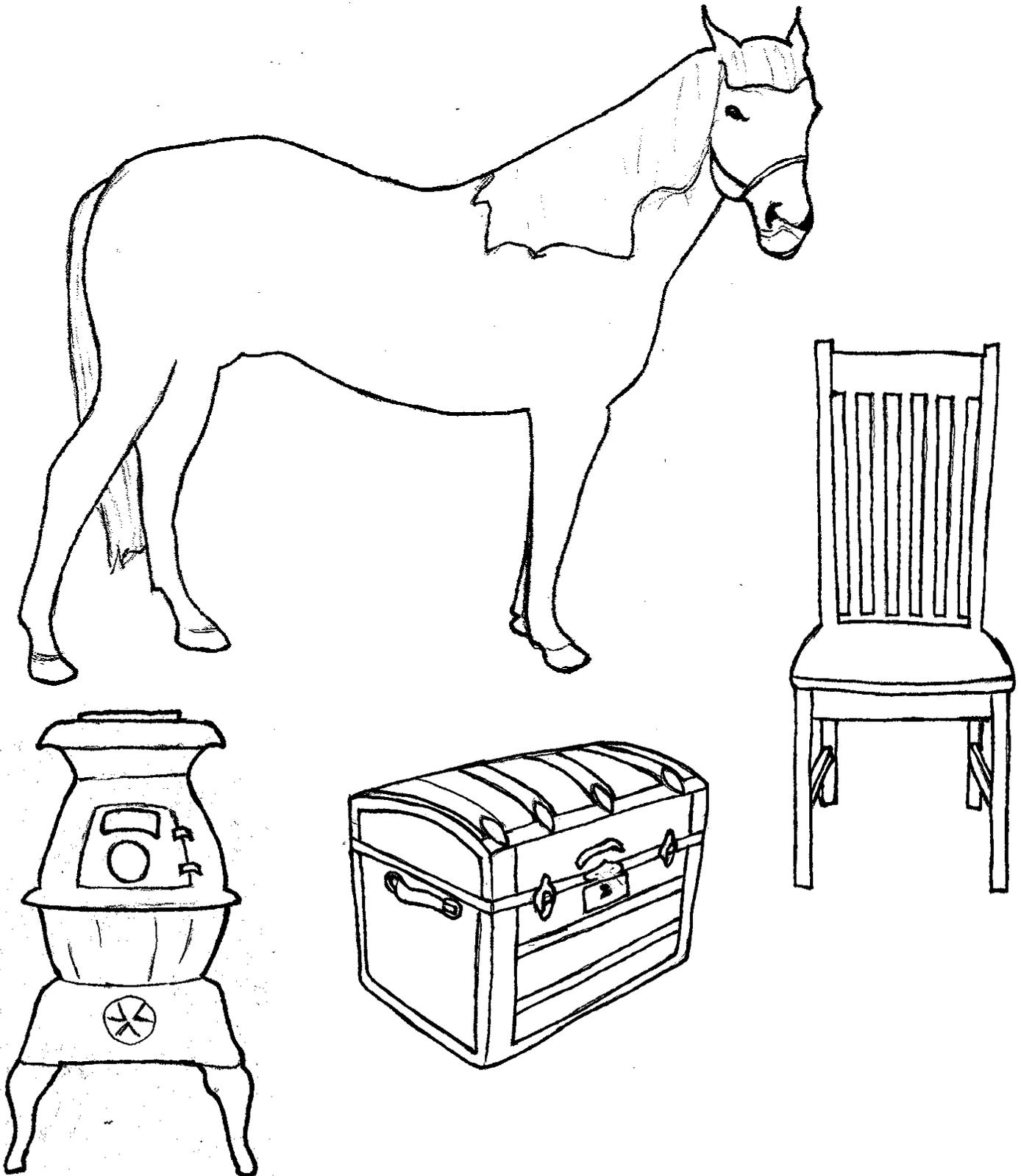
Loading an Immigrant Car
Coloring Sheet 5
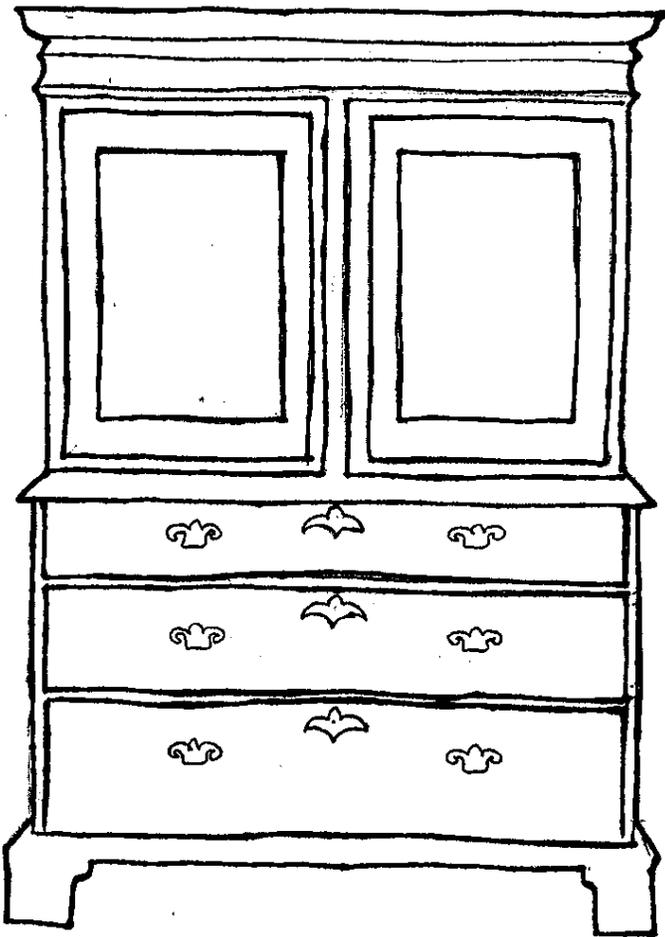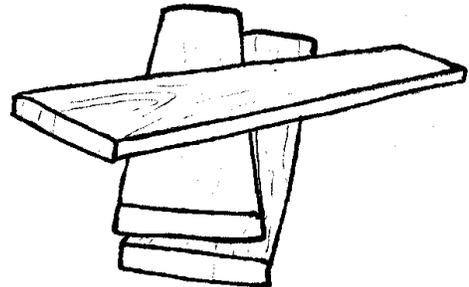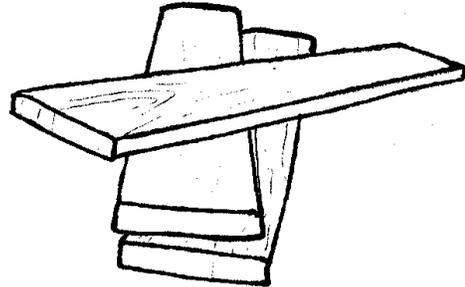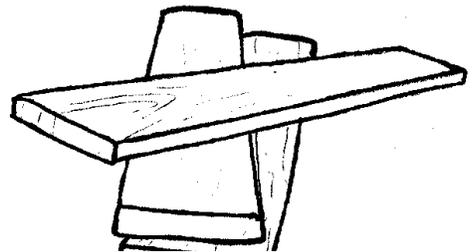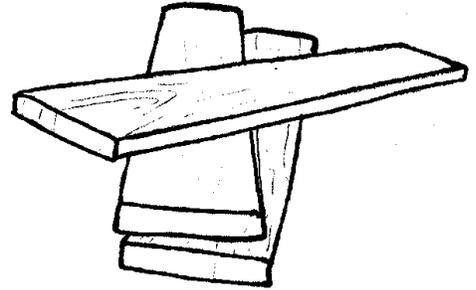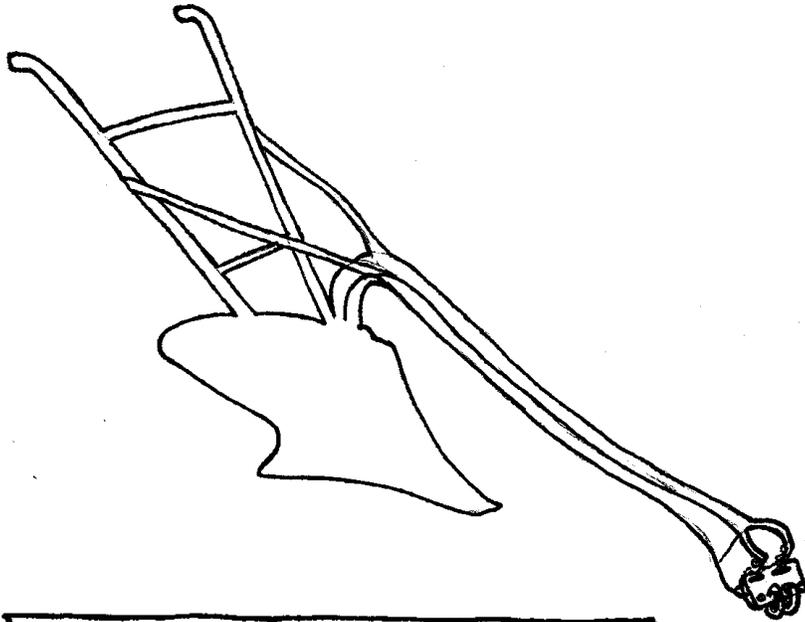
Loading an Immigrant Car
Coloring Sheet 6
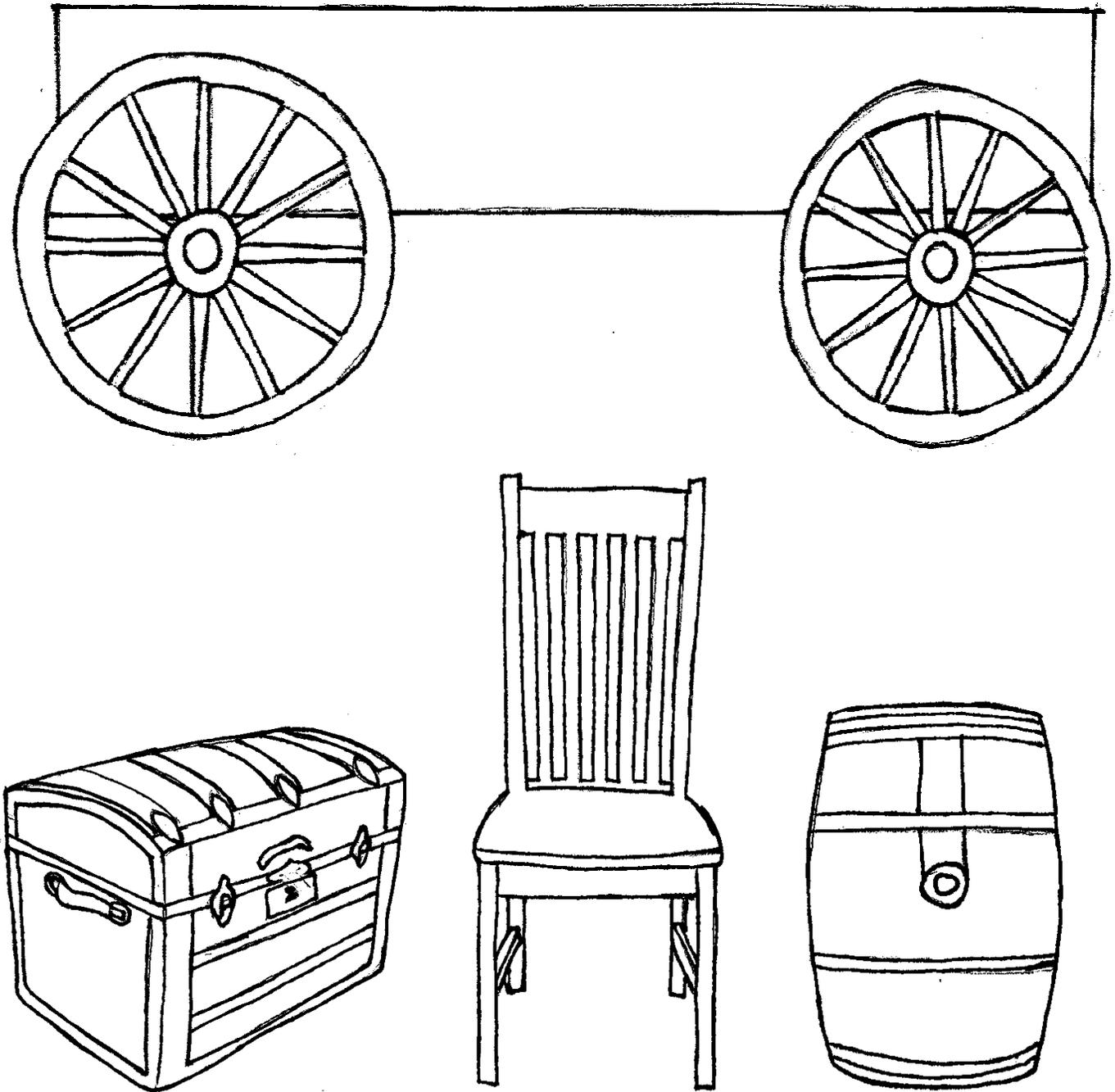
Build a Road

Objectives:
- Participants will name three different types of road surfaces.
- Participants will identify three layers in a constructed road.
- Participants will make a model of a paved highway.

South Dakota Math Standards

K	1st	2nd	3rd	4th	5th	6th
	1.M.1.5		3.M.1.4	4.M.1.4	5.M.1.4	

South Dakota Social Studies Standards

K	1st	2nd	3rd	4th	5th	6th
		2.US.1.2				6.E.1.1

South Dakota Science Standards

K	1st	2nd	3rd	4th	5th	6th
K.P.1.1	1.P.1.1		3.E.1.2	4.S.1.2	5.S.2.1	6.S.1.1

South Dakota Communication Arts Standards

K	1st	2nd	3rd	4th	5th	6th
K.LVS.1.2	1.LVS.1.2	2.LVS.1.2				

Timeframe: 45-60 minutes

Materials:

Included in kit	Provided by instructor or participants
- Photos 20, 22, and 27 - Asphalt sample - Concrete sample - Quartzite rock samples	- Newspaper - Measuring cup - Potting soil (1/2 cup per road) - Aquarium gravel (2 ½ cups per road) - Modeling clay (1 "stick" or 4 oz. per road) 12x12 inch cardboard (1 per road) - Table knife

Background Information:

South Dakota has 83,744 miles of highways, roads and streets. They are surfaced with asphalt, concrete, and gravel. Asphalt roads are more flexible than concrete roads. To help water run off, roads are built higher in the center than on the edges. The typical driving lane on a state highway in South Dakota is 12 feet wide.

Three layers make up a road – *subgrade* or dirt, *finegrade* or gravel/rock, and the concrete or asphalt *pavement surface*. Many South Dakota roads use gravel as their final surface. Quartzite from quarries in eastern South Dakota give many of the state's roads a distinctive pink color.

To build a good road, each layer must be even and compacted or pressed down before the next layer is added. A road grader and roller do this job. In this activity, participants will build a road model, showing the subgrade, finegrade and pavement surface.

Activity Steps:
1. Have the newspapers, potting soil, aquarium gravel, and modeling clay in a spot easily accessible to the participants. They can each build a road or work together as partners or in small groups.
2. Share the background information with the group and view the photographs. Have participants identify the three types of road surfaces in the photos. (Photo 20 – gravel; Photo 22 – asphalt; Photo 27 – concrete.) Pass around and examine the asphalt, concrete, and quartzite rock samples.
3. Have each road builder or group spread newspaper over their construction site. Give them a piece of cardboard. On their construction site, next to the cardboard, have them measure out ½ cup of potting soil, 2 ½ cups of gravel, and one stick (4 oz) of clay. The materials should NOT be touching each other at this point.
4. Have them flatten the clay into a ¼" slab. Spread the gravel out and press the clay into the top of the gravel. Turn the clay over then press it into the gravel again. This makes the "asphalt" for the road. Set it aside.
5. On the cardboard, press the potting soil into a mound about 4x6 inches. The top of the mound should be rounded slightly.
6. Add the gravel to the top of the soil and press it down. This forms the finegrade layer of the road, or the pavement layer of a gravel road.
7. Lay the prepared modeling clay "asphalt" over the gravel and press it down firmly. Remember, the road should be higher in the middle than on the edges so water will flow off.
8. With the table knife, cut through the prepared road. Have participants identify the three road layers – subgrade (dirt); finegrade (gravel); and pavement surface (asphalt).

Traffic Sign Matchup

Objectives:

- Participants will identify six traffic sign shapes and colors.
- Participants will match sign shapes to the information they give.
- Participants will share in their own words why traffic signs are important for safe driving.

South Dakota Math Standards

K	1st	2nd	3rd	4th	5th	6th
K.A.4.2 K.G.1.1	1.G.1.1	2.G.2.1	3.G.1.1 3.G.1.2	4.G.1.1		

South Dakota Social Studies Standards

K	1st	2nd	3rd	4th	5th	6th
	1.C.2.1	2.C.1.1 2.C.1.2	3.C.1.4			

South Dakota Communication Arts Standards

K	1st	2nd	3rd	4th	5th	6th
K.LVS.1.1 K.LVS.1.6	1.LVS.1.3 1.LVS.1.6					

Timeframe: 30-45 minutes

Materials:

Included in kit	Provided by instructor or participants
- Traffic sign worksheet master - Stop sign - Railroad crossing sign	- Red, orange, yellow, black, white crayons - Pencil - flashlight

Background Information:

Traffic and highway signs give drivers information by color, shape, words, and numbers. Traffic signs are the same all across the country. The same signs are always the same shape and color. Permanent signs are made of reflective metal so they shine brightly when car lights hit them at night. Signs give drivers important information about the road. Signs tell drivers they must stop, how fast they can drive, and if it is unsafe to pass. Signs also tell drivers they will be crossing railroad tracks, when they must yield to other traffic, and if there is construction on the road ahead. There are variations of road signs. For example, on major roads the signal for a railroad crossing is a white crossbar with black letters. On smaller roads, a railroad crossing is marked by a yellow circle with a black X and the letters R R.

Activity Steps:

1. Turn the lights off in the classroom and hold up the stop sign. Have one of the participants shine the flashlight on the sign to show how it reflects the light. Do the same with the railroad crossing sign. Have the group discuss why it is important for signs to show up well at all times of the day and night and in all kinds of weather.
2. Give each participant a Know Your Traffic Signs worksheet.
3. Have participants draw a line between the sign shape and the information the sign gives drivers.
4. Have participants color the sign shapes in the correct color.

      a. Stop – red
      b. Yield – yellow
      c. Speed limit – white with black numbers
      d. No passing – yellow
      e. Railroad crossing – white with black letters
      f. Construction zone – orange

5. Discuss:
   - What kind of important information do drivers get from traffic signs?
   - Why do you think traffic signs are different colors?
   - What other kinds of signs do you see along the road? (information signs, billboards, mile markers)

Name _____

Know Your Traffic Signs

Draw a line connecting the shape on the left to the correct sign message on the right.
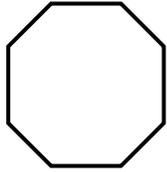
Railroad Crossing
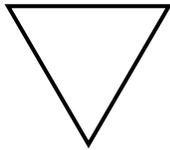
Speed Limit
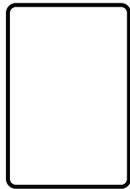
Construction Warning
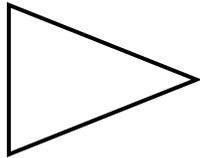
Stop
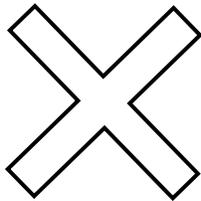
Yield
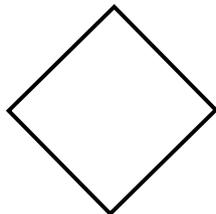
No Passing

Name _____

Know Your Traffic Signs Key

Draw a line connecting the shape on the left to the correct sign message on the right.

Railroad Crossing

Speed Limit

Construction

Stop

Yield

No Passing
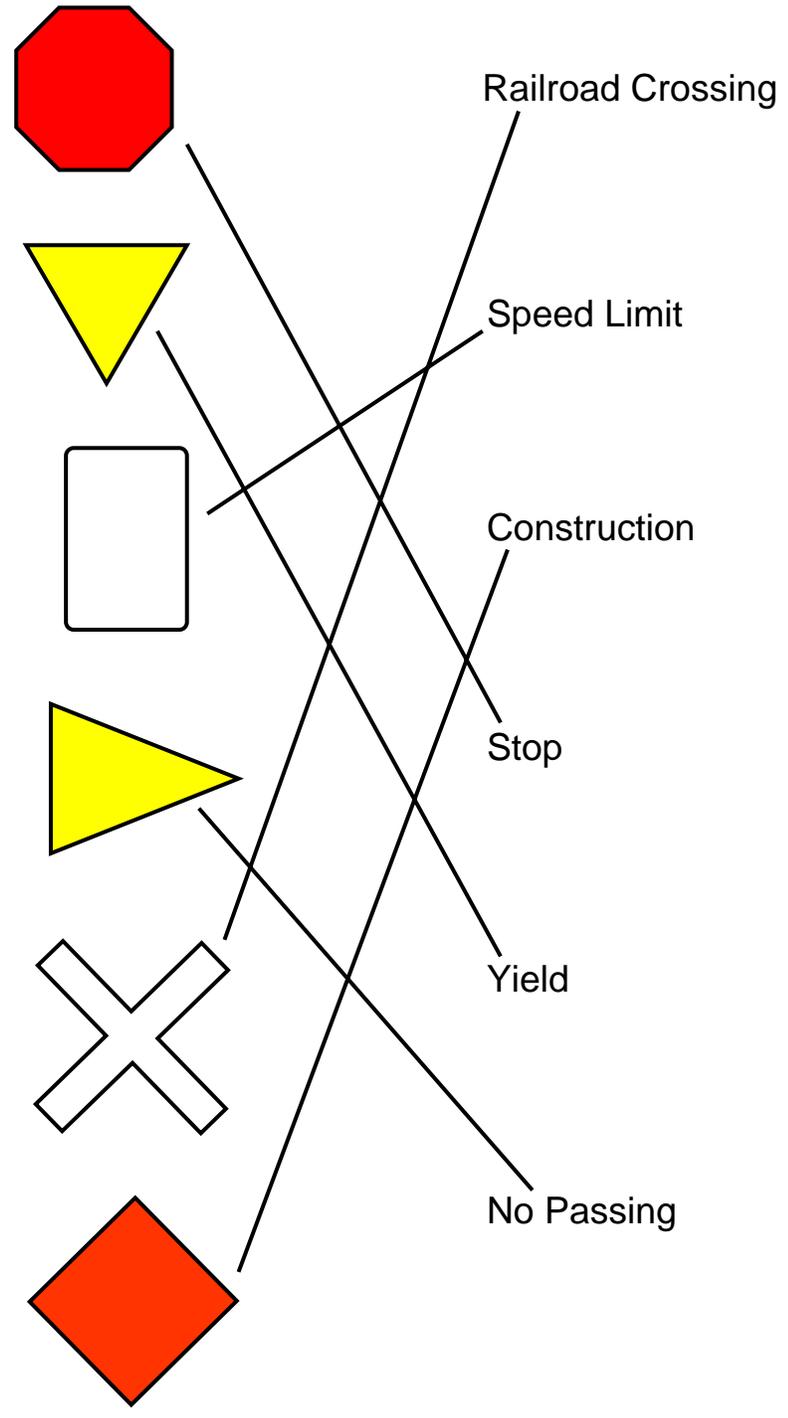
Airplane Parts

Objectives:
- Participants will name three types of airplanes that fly in South Dakota.
- Participants will identify nine parts of an airplane.
- Participants will recognize the function of each part.

South Dakota Social Studies Standards

K	1st	2nd	3rd	4th	5th	6th
						6.E.1.1

South Dakota Science Standards

K	1st	2nd	3rd	4th	5th	6th
K.P.1.1		2.P.2.1			5.S.1.1	6.S.1.1

South Dakota Communication Arts Standards

K	1st	2nd	3rd	4th	5th	6th
K.LVS.1.1 K.LVS.1.6	1.LVS.1.6	2.W.2.4		4.R.1.2 4.LVS.1.2		

Timeframe: 30-45 minutes

Materials:

Included in kit	Provided by instructor or participants
▪ What Part Is It? Airplanes worksheet master	▪ Paper ▪ Pen or pencil ▪ Crayons, colored pencils, or markers

Background information:

Airplanes fly across South Dakota skies many times a day. Some are commercial airliners, carrying people to other cities, states, and countries. Some are military aircraft flying manuevers. Crop dusting airplanes are a familiar site, flying low over the fields as they spray. Personal aircraft are used for business or flown just for fun. All airplanes have some parts in common. In this activity, participants will identify nine parts of an airplane and recognize what each part does.

Fuselage – The body of the airplane that holds all the pieces together.
Cabin – Pilots sit here when flying small planes. On larger planes, passengers sit in the cabin and the pilot sits in the cockpit at the front.
Propeller – Provides the thrust to push the airplane through the air. Some planes have jet engines for this job.
Engine – Provides the power to make the propeller turn.
Vertical stabilizer – Keeps the nose of the plane from swinging from side to side.

Horizontal stabilizer – Keeps the plane's nose from moving up and down.
Rudder – Moves from side to side to steer the plane.
**Wing** – Generate the lift that holds the plane in the air.
Landing Gear – Wheels that let the plane taxi for takeoff and land safely. On big planes, the landing gear retracts inside the plane.

Activity steps:
1. Give each participant a copy of the What Part Is It? Airplanes worksheet.
2. Share the background information with the group. Have participants name three types of planes they may see flying in South Dakota. As you discuss each of the airplane parts, have participants label the part on their worksheet.
3. Have participants color the airplane.

Name _____

Airplane Parts

fuselage	engine	horizontal stabilizer	cabin
landing gear	rudder	propeller	wing
vertical stabilizer			

1

2

3

4

5

6

7

8

9

Name _____

Airplane Parts Key

fuselage	landing gear	engine	horizontal stabilizer	cabin
	vertical stabilizer	rudder	propeller	wing

8 **engine**

9 **propeller**

7 **fuselage**

6 **wings**

5 **landing gear**

4 **cabin**

1 **vertical stabilizer**

2 **rudder**

3 **horizontal stabilizer**
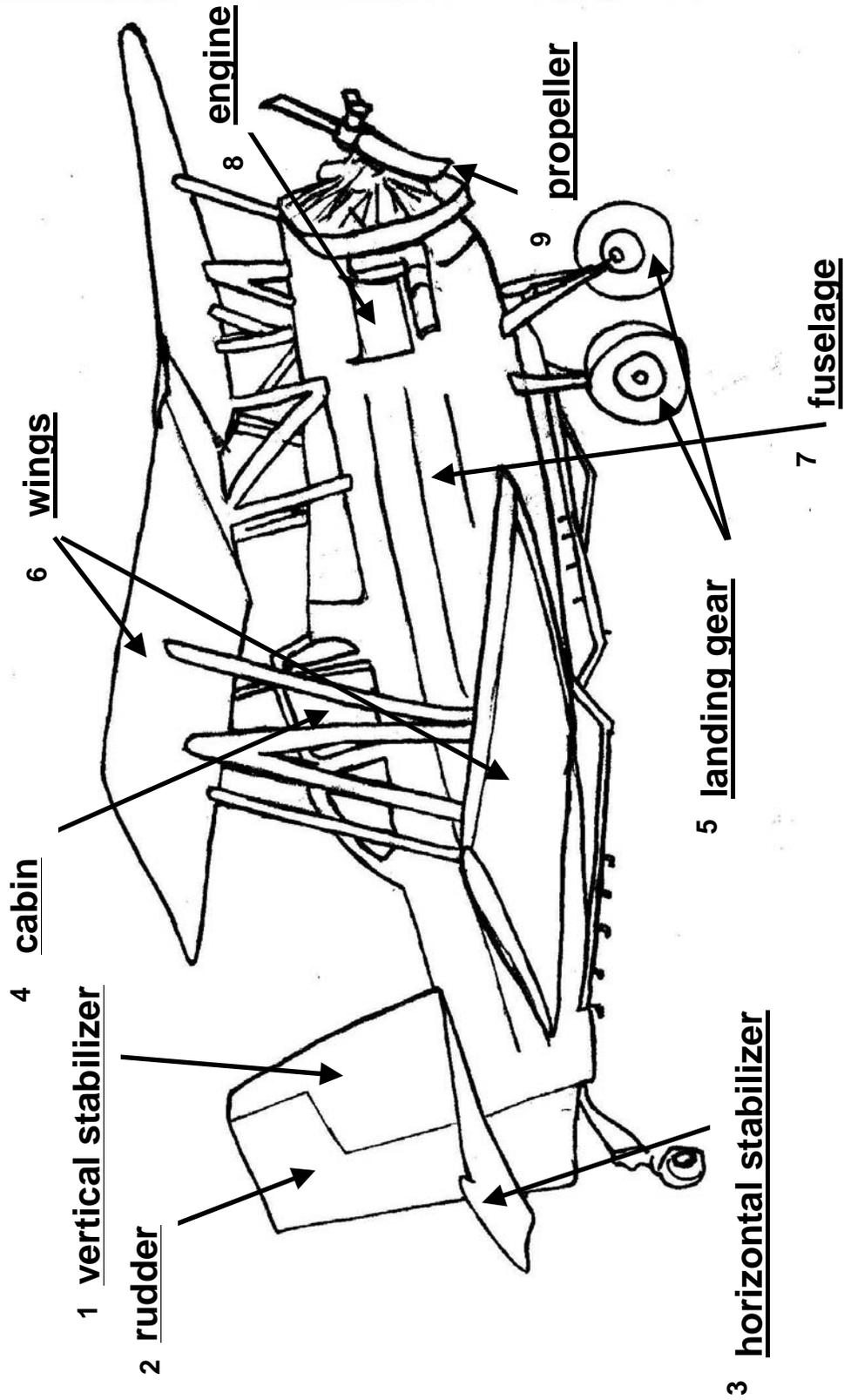
Time to Travel

Objectives:
- Participants will determine the distance between two South Dakota locations following roads and as the crow flies.
- Participants will calculate the time it takes to travel between the two locations using different transportation methods.
- Participants will create a graph to compare the travel times between each transportation method.

South Dakota Social Studies Standards

K	1st	2nd	3rd	4th	5th	6th
K.G.1.1		2.US.1.2 2.G.1.2	3.W.1.1 3.G.1.1	4.US.1.1 4.G.1.2		

South Dakota Math Standards

K	1st	2nd	3rd	4th	5th	6th
	1.M.1.5 1.S.1.1 1.S.1.2	2.N.2.1 2.N.3.1 2.S.1.3	3.A.1.1 3.N.2.1 3.S.1.1	4.M.1.3 4.N.2.2 4.S.1.1	5.M.1.4 5.S.1.1	

South Dakota Communication Arts Standards

K	1st	2nd	3rd	4th	5th	6th
K.LVS.1.2 K.LVS.1.6	1.LVS.1.2 1.LVS.1.6	2.LVS.1.6	3.W.2.1			

South Dakota Science Standards

K	1st	2nd	3rd	4th	5th	6th
	1.P.2.1	2.P.2.1 2.E.1.2		4.S.1.1 4.S.1.2	5.S.1.1 5.S.1.2	6.S.1.1

Timeframe: 60 minutes

Materials:

Included in kit	Provided by instructor or participants
6 SD Highway Maps - Time to Travel worksheet masters	- pencil - scratch paper - ruler - graph paper

Background information:
There are many ways to travel across South Dakota. Walking and riding horseback are basic forms of transportation. In the past, people used wagons and stagecoaches to get across the state. Today, people drive cars on some of the same roads that were originally used by wagons and stagecoaches. Railroads hauled goods and people across South Dakota, too. Now, airplanes do the same thing.

Every transportation method has good points and bad points. Walking a long distance takes a long time. Wagons and stagecoaches went faster and could haul goods, too. Roads were rugged and dusty. Trains covered distance in much less time, but could only go where the track was laid. Airplanes fly a great speed, but need special fields for landing and taking off. In this activity, participants will calculate the time it takes to cross South Dakota using different transportation methods.

Activity Steps:
1. Divide participants into six groups. Give each group a SD Highway map and give each participant a copy of Time to Travel Worksheets 1 and 2.
2. Have participants study the maps and complete the county lists on worksheet 1.
3. Either individually, or as a small group, have participants choose one town from the eastern counties and one from the western counties. They will "travel" between the two locations.
4. Have participants measure the distance between their towns:
   - by adding up the mileage numbers on the roads between the two towns.
   - by using the map's scale of miles and their ruler to calculate the overland distance between the two places.
5. Have participants choose to use either the mileage distance or the overland distance for the rest of the activity.
6. Using the speed table, have participants calculate the time it would take to travel between their chosen locations by each transportation method and complete worksheet 2.
7. Have participants graph their results and compare the travel times between the transportation methods.
8. Discuss:
   - Which travel method is the fastest? Slowest?
   - Have any of the participants traveled by the different methods discussed, i.e. by rail or by airplane in addition to driving? How about riding horseback? What was their experience like?
   - Which travel method would participants like the best? Which would they like the least? Why?

Name _____

Time to Travel Worksheet 1

1. Write down the counties that are along the western and the eastern sides of South Dakota below.

2. Choose one town from the western counties and one from the eastern counties. Write your choices below. You will "travel" between the two towns for this activity.

West	East
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
	7.
	8.

Western South Dakota town: Eastern South Dakota town:

_____   _____

3. Add up the mileage numbers on the roads between the two towns to find the distance by road between them.

_____ miles

4. Using a ruler, measure the shortest distance between the two towns. On the scale of miles, one inch = 15.43 miles. Calculate how many miles there are between the towns.

_____miles

Use the number of miles from question 3 OR from question 4 to figure out the answers on worksheet 2. Use the same number of miles for each calculation.

Name _____

Time to Travel Worksheet 2

How fast?

Method	Miles per Hour
Walking	3
Wagon	4
Stagecoach	9
Horseback	12
Train	50
Car	65
Airplane	600

How long will it take?

1. Divide the number of miles between the two towns by the miles per hour for each transportation method above to find out how long it takes to travel by each method between the towns.

Transportation Method	Time for travel
1. Walking	
2. Wagon	
3. Stagecoach	
4. Horseback	
5. Train	
6. Car	
7. Airplane	

Planes, Trains and Automobiles: What Do You See?
Photo analysis

Objectives:
- Participants will identify five modes of transportation that have been used in South Dakota.
- Participants will compare photographs of two different means of SD transportation.
- Participants will explain three differences between two modes of transportation.

South Dakota Communication Arts Standards

K	1st	2nd	3rd	4th	5th	6th
K.W.2.1 K.W.2.2 K.W.2.3 K.LVS.1.1 K.LVS.1.2 K.LVS.1.5	1.W.2.1 1.W.2.3 1.LVS.1.1 1.LVS.1.2 1.LVS.1.5	2.W.2.3 2.W.2.4 2.LVS.1.2 2.LVS.1.6	3.W.2.3	4.W.1.2		

South Dakota Social Studies Standards

K	1st	2nd	3rd	4th	5th	6th
		2.US.1.2				

South Dakota Visual Art Standards

	K	1	2	3	4	5	6
Std. 1: Visual arts as communication	X	X	X	X	X	X	X

Timeframe: 30-45 minutes. This can also be set up as an activity center for individual work.

Materials:

Included in kit	Provided by instructor or participants
- 29 Photographs - Planes, Trains & Automobiles worksheet master	- Pen or pencil

Background information:
Photographs provide good information about how South Dakotans have traveled over the years. They are an important tool for learning about the past. Pictures show things that might not otherwise be remembered. Analyzing photographs helps historians understand the people and events that they study. In this activity, participants will analyze photos about transportation methods used in the state. Some of the photos are more recent than others – a good discussion starter. Deciphering a photograph is like being a detective. What details in the photo give hints about the time or place it was taken? The clothes worn by the people or the technology shown are good clues to watch for. In this activity, participants will identify five different ways South Dakotans have traveled. They will compare two of those transportation methods shown in photographs, and write out three differences they find between the two photos.

Activity steps:
1. Put the kit photographs in a place where all participants can see them.
2. As a group, organize the photos by transportation type – horsedrawn, steamboat, automobile, train, airplane.
3. Partner up the participants. Have each pair choose two photos – the photos must be from two different transportation types, i.e. a horsedrawn and a steamboat, or a train and an airplane, etc.
4. Give each pair a Planes, Trains & Automobiles worksheet to complete.
5. Gather as a group and discuss:
   - Identify the five types of transportation shown in the photos
   - What is your favorite way to travel? Why?
   - Do you think South Dakotans of the future will travel in different ways? How?

Name _____

Planes, Trains & Automobiles: What do you see?
Worksheet

Write in the answers to the questions based on the two photographs.

1. What two different types of transportation are shown?

   a._____   b. _____

2. List three differences between the two types of transportation:

   a._____

   b._____

   c._____

3. Does one photo show an earlier period of time than the other? How can you tell?

_____

_____

4. Which type of transportation is faster?

_____

5. Of the two transportation types, which would you rather use? Why?

_____

_____

_____

_____

What's the Story?
Creative Writing

Objectives:
- Participants will analyze a photograph.
- Participants will draw conclusions based on photographic data.
- Participants will write and illustrate a short story.

South Dakota Communication Arts Standards

K	1st	2nd	3rd	4th	5th	6th
K.W.1.1	1.W.1.1	2.W.1.1	3.W.1.3			
K.LVS.1.1	1.W.1.2	2.LVS.1.4	3.LVS.1.1	4.W.1.2	5.W.1.1	6.W.1.1
K.LVS.1.6	1.LVS.1.1	2.LVS.1.5	3.LVS.1.3	4.LVS.1.3	5.LVS.1.4	6.LVS.1.2
K.LVS.1.7	1.LVS.1.6	2.LVS.1.6	3.LVS.1.4			

South Dakota Visual Art Standards

	K	1	2	3	4	5	6
Std. 1: Visual arts as communication	X	X	X	X	X	X	X

Timeframe: 30-45 minutes. Can also be set up as an activity center.

Materials:

Included in kit	Provided by instructor or participants
▪ 29 photographs ▪ Photo analysis worksheet master	▪ Paper ▪ Pen or pencil ▪ Crayons, colored pencils or markers

Background information:

　　Photographs contain a wealth of information. They offer an interesting view of events, places, and people that a written description cannot always match. Looking closely at a photo reveals many clues about the time and place where it was taken. What kind of clothing are the people wearing? Is the photo black and white, or color? Does it show a special occasion or everyday life? In this activity, participants will analyze a photograph and use it as an inspiration to create their own short story.

Activity steps:
1. Set the photographs out so participants can see them. Give each participant a copy of the photo analysis worksheet.
2. Have participants choose the photo they would like to analyze and use as inspiration for a story. More than one participant can use the same photo. (Alternative: Have all participants analyze and write about the same photo.)
3. Have participants look closely at their photo and complete the worksheet.
4. Have them write a short story (or poem) about the photograph. The story should be at least 8 sentences long. Have them consider:
   - Setting – where will their story take place? When – in the present? Past? Future?
   - What point of view is the story told from? A person in the photo? An animal? An object – perhaps from the car, automobile, train or stagecoach pictured?
   - What are the story characters doing? Are they playing? Working? Escaping from danger?

- How do the characters feel? Happy? Confused? Angry?
5. Have participants draw and color a picture to illustrate their story.
6. Let participants share their stories with the group.

Name _____

# What's the Story?
Photo analysis worksheet

Answer the following questions:

1. Was the photo taken inside or outdoors? _____

2. Are there people in the photograph? _____ How many? _____

3. List four things you see in the photo:

   a._____

   b._____

   c._____

   d._____

4. What is happening in the photograph? Describe what you see.

_____

_____

_____

5. Was the photo taken recently or in the past? How can you tell?

_____

_____

_____

Covered Wagon Cutout Sheet 1

wagon
bed

tongue

wheels

Covered Wagon Cutout Sheet 2

water barrel

toolbox

wagon cover

seat
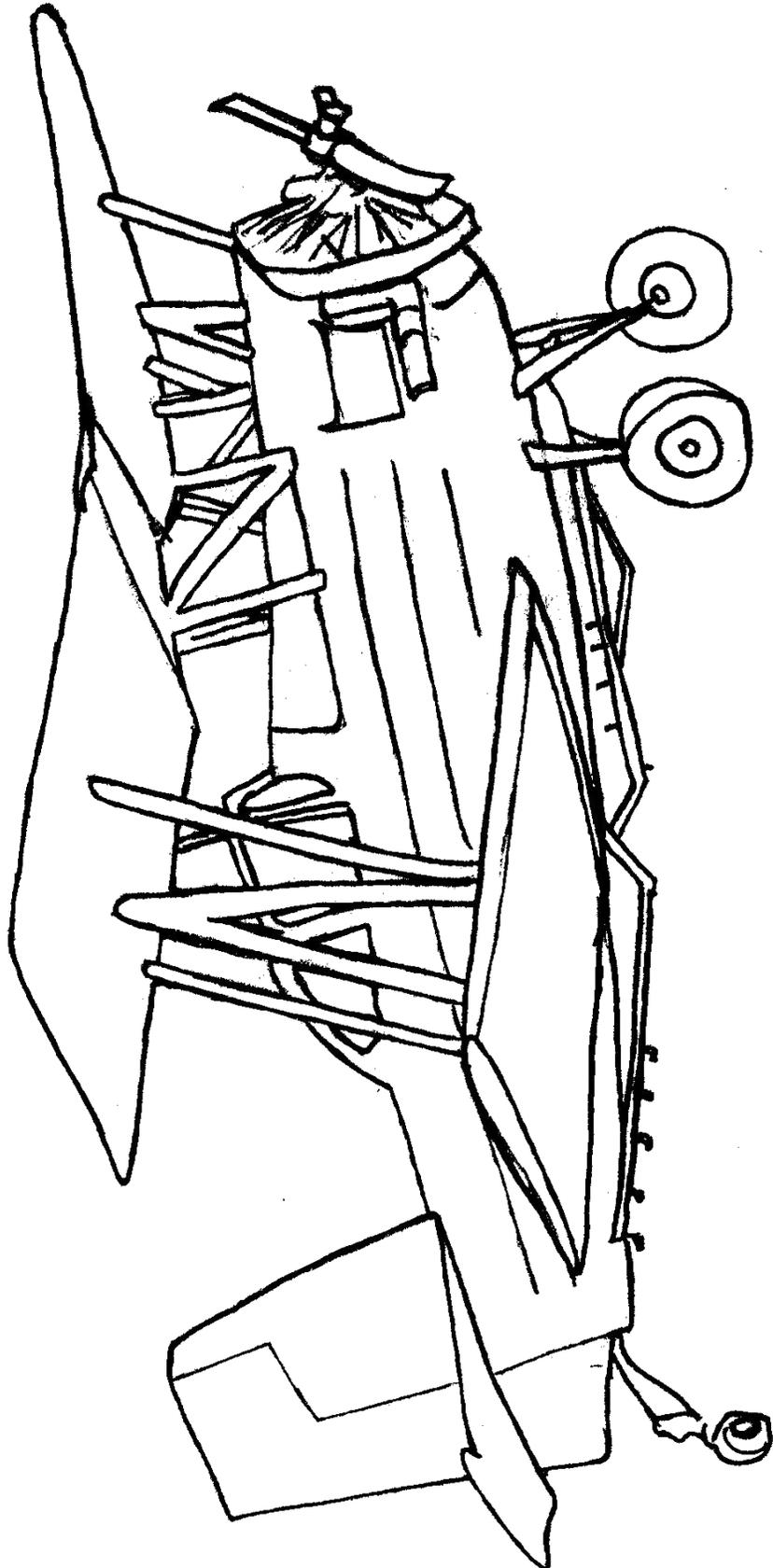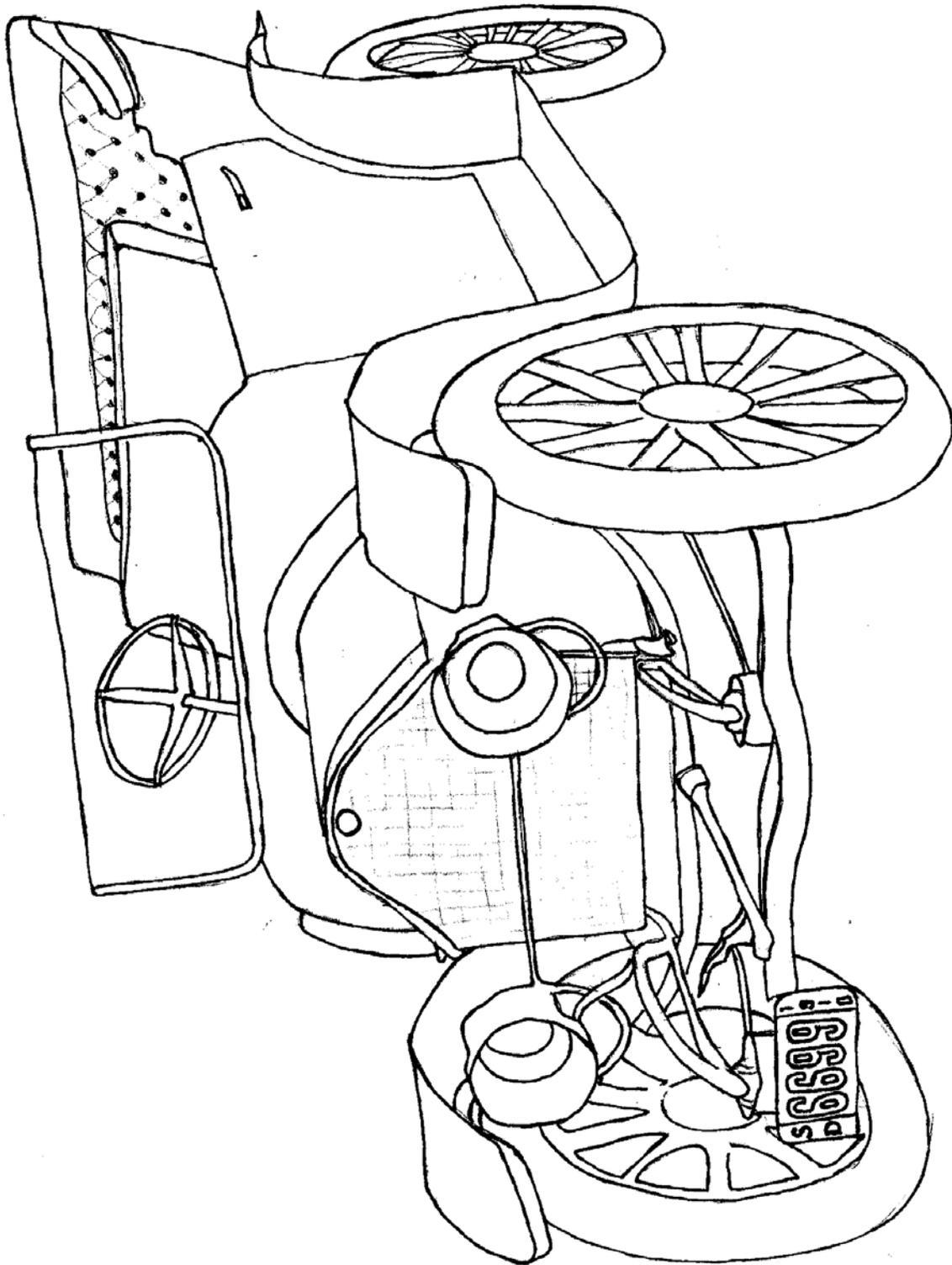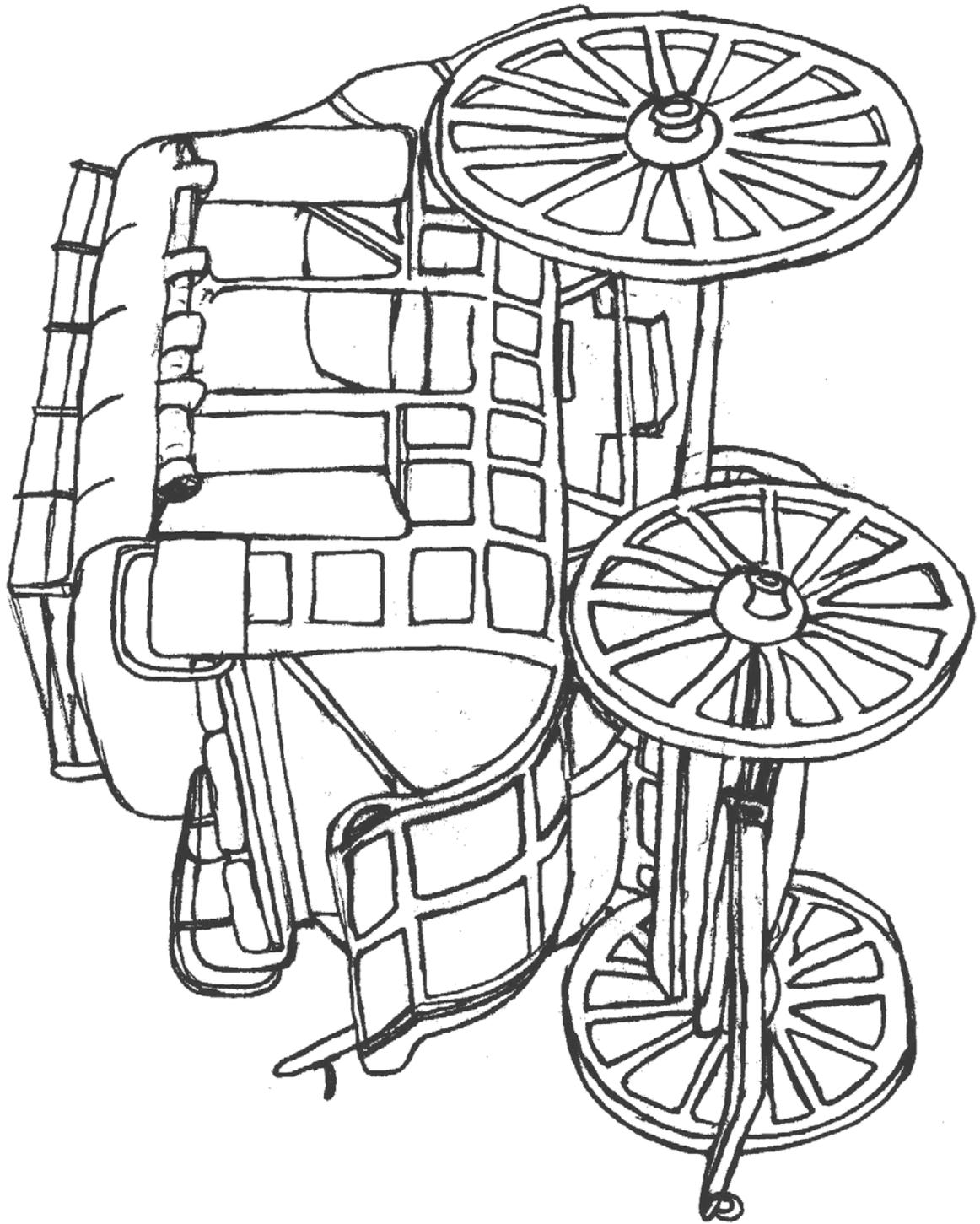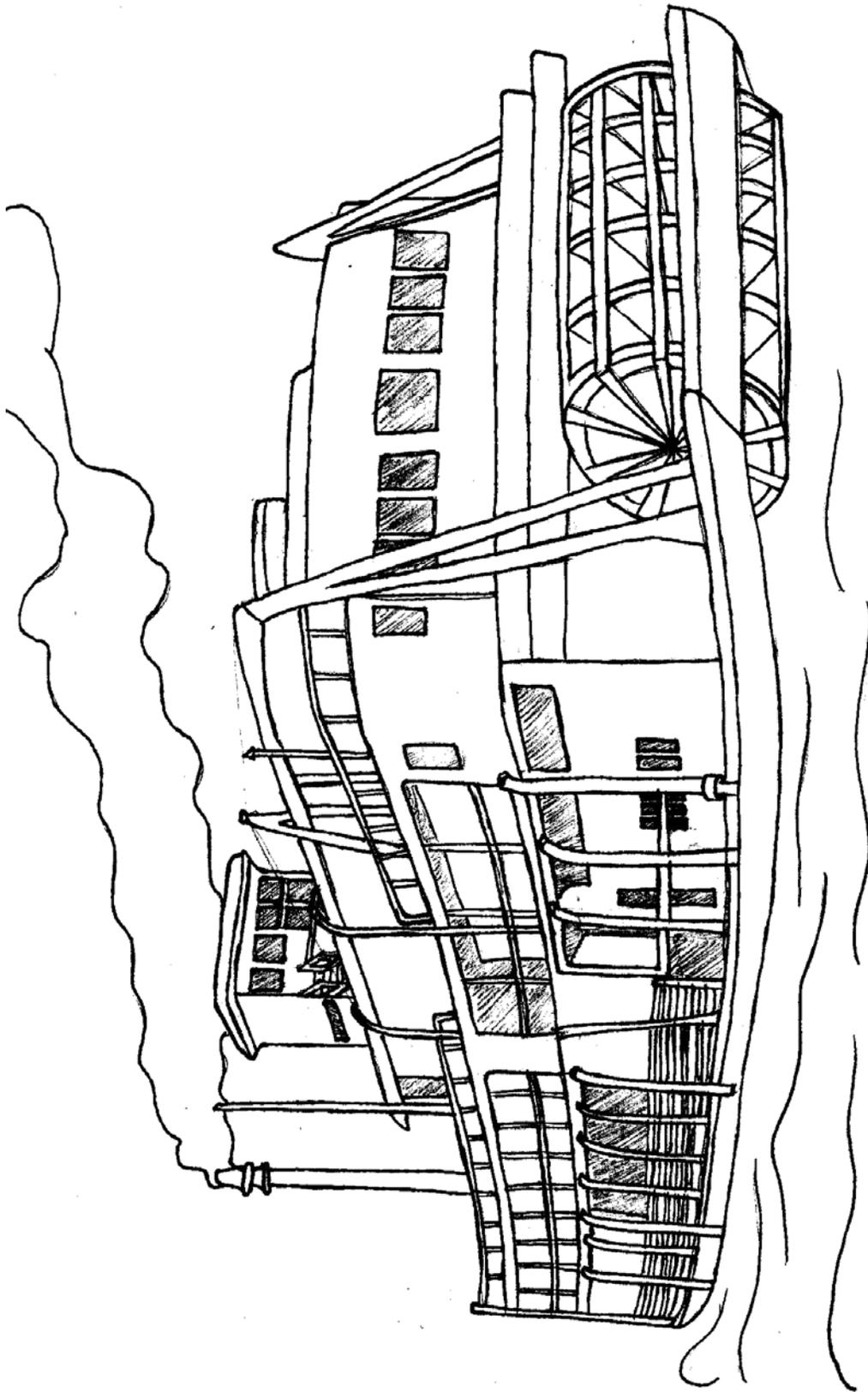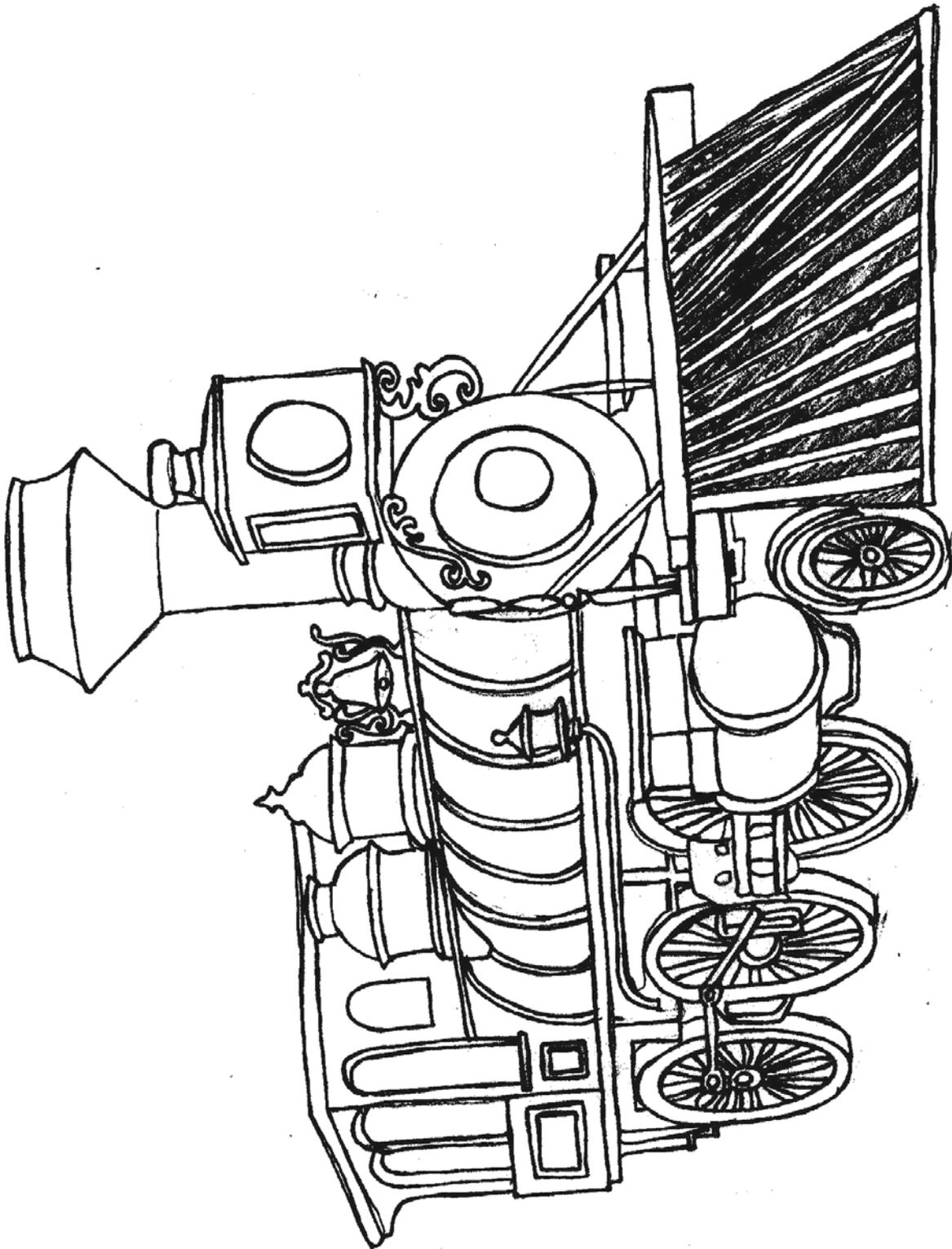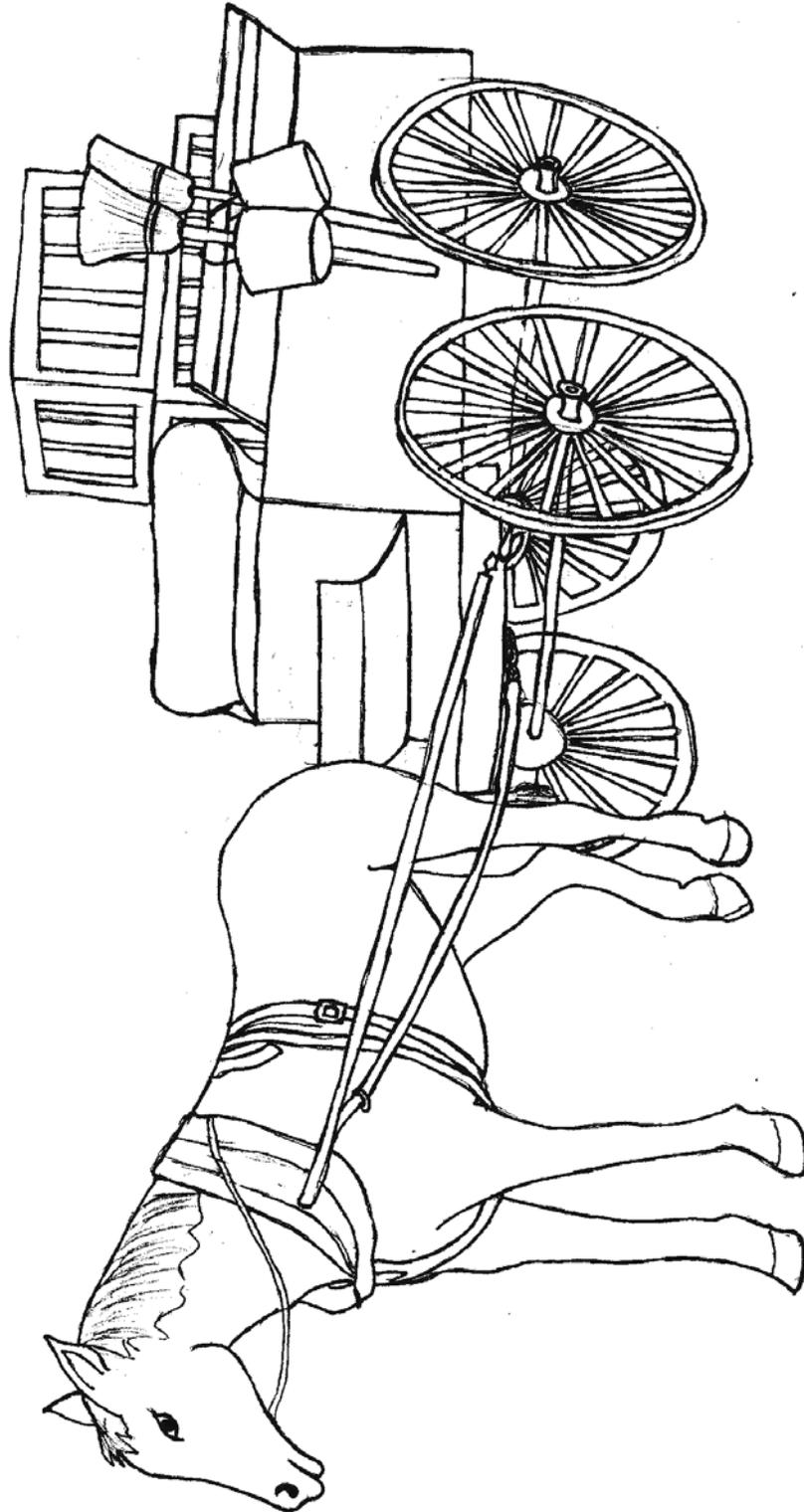
Covered Wagon Assembly

1. Cut out wagon parts along dotted lines. Color the parts if you like.
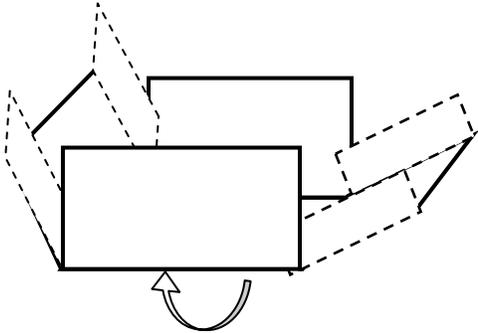
2. Fold sides of wagon box along solid lines. Glue tabs to inside, forming box.

3. Fold in the tabs on the wagon seat and glue the seat to the wagon box. Glue the wheels to the wagon box.
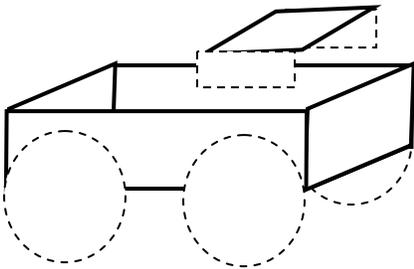
4. Form the water barrel into a cylinder and glue.

5. Fold the toolbox along the solid lines. Glue the tabs inside to form a box.

6. Glue the cover to the wagon box sides. Glue the water barrel to one side of the wagon box between the wheels, and glue the toolbox to the other side.
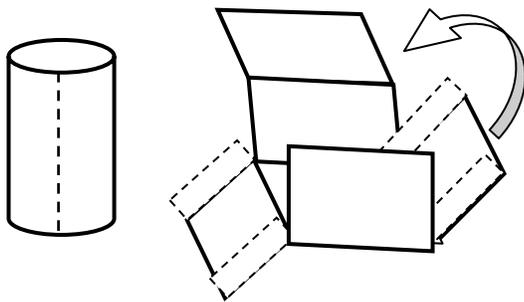
7. Glue the tongue to the underside of the wagon box.
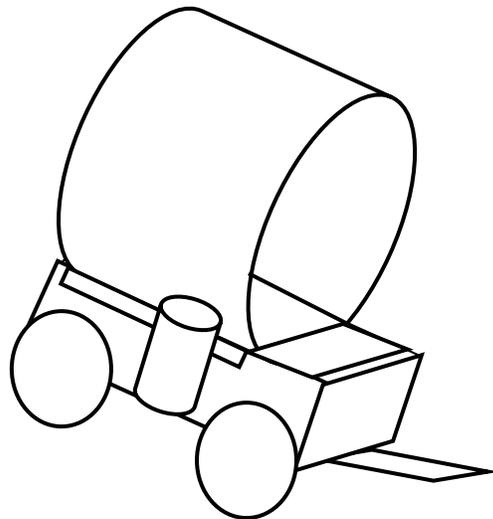
Buckboard Wagon Cutout
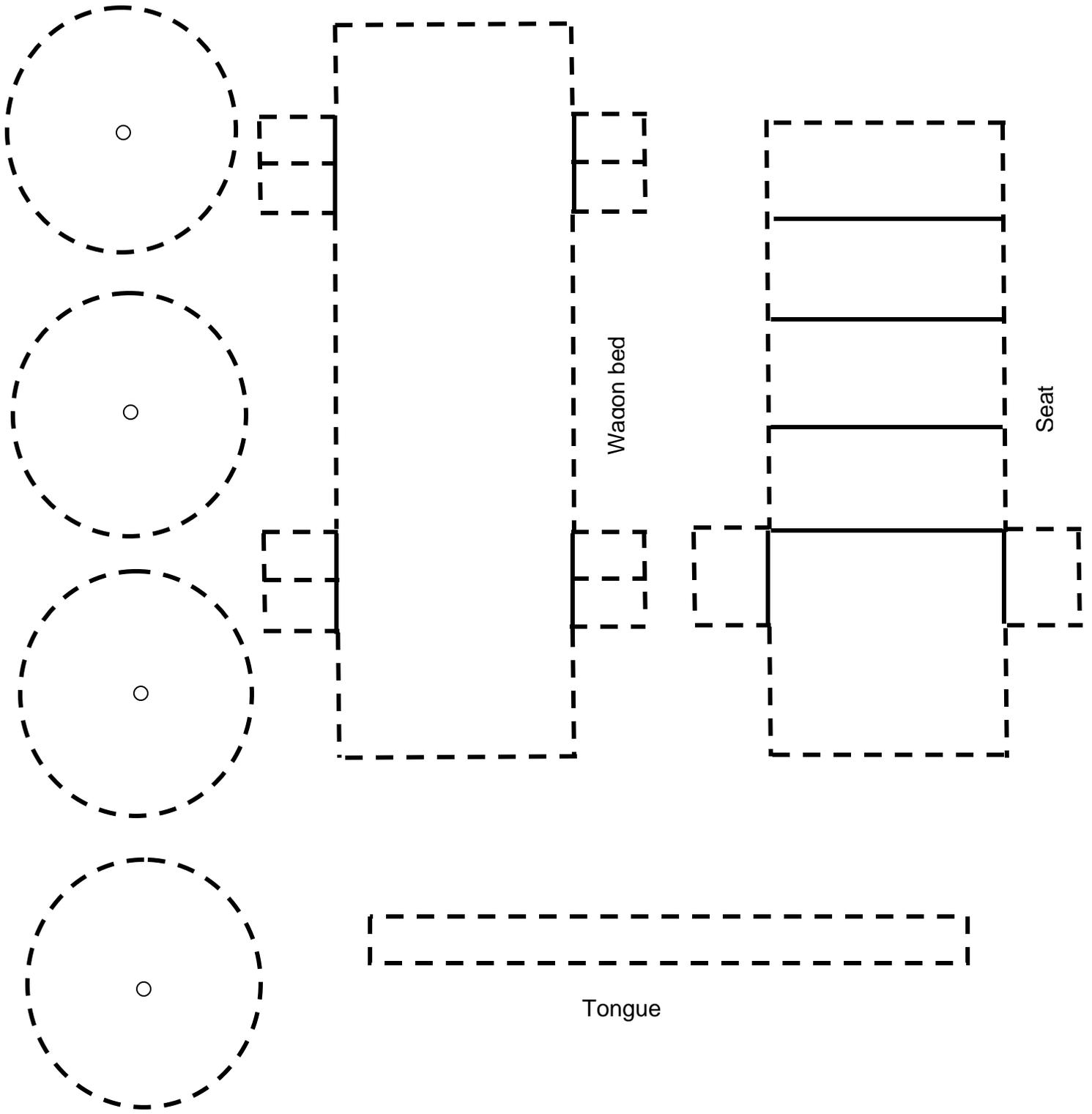
Wagon bed

Seat

Tongue

Wheels

Buckboard Wagon Assemby

1. Cut out all wagon pieces along dotted lines.

2. Fold the wagon seat along solid lines to form a rectangle. Fold in and glue down side tabs to hold seat together.

3. Glue seat to wagon bed.
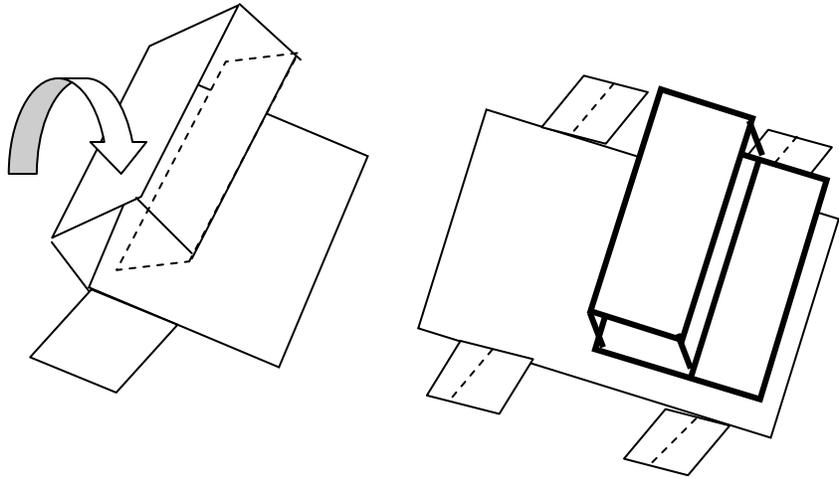
4. Cut wheel tabs along dotted line. Fold one half up and one half down. Glue wheel to tabs.
5. Glue tongue to bottom of wagon bed.