

BICYCLE MAINTENANCE AND REPAIR

NAME _____ SCHOOL _____

DATE STARTED _____ DATE COMPLETED _____

PREREQUISITE: The ability to use simple hand tools (student should be old enough to camp out overnight, away from home).

HOW TO DO THIS COURSE: Do the steps one at a time, in order. When you finish a step, put your initials and the date on the sign-off line on the right. A split line means get a pass (and an initial) from another student (or your supervisor if it says that). A * means get a checkout. Essays are turned in to the supervisor.

PURPOSE: Learn to maintain, repair and overhaul a single-speed or three-speed bicycle and be able to ride the bicycle on long-distance trips.

MATERIALS NEEDED FOR THIS COURSE

Student must own a single-speed or three-speed bicycle or have access to each; tube repair kit, sandpaper, detailed road map of your area (one showing all back roads and paved roads); channel lock pliers, pliers, screwdriver, two adjustable wrenches, two bicycle wrenches to fit wheel bearings, lightweight oil, a spoke (or nipple) wrench, car wax, bike cleaning supplies, a pint of kerosene, a metal can, tire pump, a topographical map of the local area (may be same as detailed map above); a clean rag, a canteen and knapsack (backpack), an old toothbrush, one ounce of bearing grease, a magazine on bicycling, a piece of wire one foot long, two bicycle tire irons, colored pencil or piece of chalk, talcum powder (optional).

Heron study booklet with these Data Sheets (DS):

2171 2177 2176 2178 2179 2180 2183 2184 2182 3193 3194 3195

Exam: 3230

A. INTRODUCTION

1. READ: DS #2171 Why Ride Bicycles? _____
2. ESSAY: Write a short essay on how the understanding of bicycle maintenance and repair will help you. _____
3. DEMONSTRATE: Look over and identify each of the tools and materials on the materials list. You will be using each of these in this course. _____

B. BICYCLE MAINTENANCE AND REPAIR

1. DEFINE: rim ___ screwdriver ___ nut ___ pliers ___ _____
2. READ: DS #2177 How to Fix a Flat Tire. _____
3. DEMONSTRATE (with whatever objects you wish to use): Each step of fixing a flat tire. _____
4. PRACTICAL APPLICATION: Re-read DS #2177, doing each step as you read it. Fix a tire on your bike if one is flat. If not, find out if someone you know has a flat tire on their bike and arrange to fix the tire for him. If you

can find no leaky or flat tire, take a pin or needle and holding it with a pair of pliers, thrust it into one of your tires to create a leak. Now proceed step by step to fix the leak in the tire.

5. DEFINE: wrench ___ clockwise ___ counterclockwise ___

*6. READ: DS #2176 Adjusting the Seat and Handlebars of a Bicycle (don't do the adjustments yet, just read the data sheet).

7. PRACTICAL APPLICATION: Re-read the above data sheet and follow each step in adjusting the seat and handlebars of your bike. When you finish, ride your bike to test the new adjustments. If the seat or handlebars need further adjustments, repeat the steps in the above data sheet to adjust them properly.

8. DEFINE: hub ___ threads ___ bolt ___

*9. READ: DS #2178 Adjustment of Bicycle Gears.

10. DEMONSTRATE (with objects): How you know when your gears are adjusted properly.

11. DEMONSTRATE: Look at a three-speed bike and notice where to adjust the gears.

12. PRACTICAL APPLICATION (optional): Adjust the gears of a three-speed bicycle. Test your adjustments by riding the bike using all of the gears. Make further adjustments if necessary until the gears are just right.

13. DEFINE: maintenance ___ lubrication ___ bearings ___ corrode ___

*14. READ: DS #2179 General Bicycle Maintenance.

15. DEMONSTRATE (with objects): Why you should give your bicycle general maintenance.

16. PRACTICAL APPLICATION: Clean your bicycle thoroughly then wax all parts that should be waxed.

17. PRACTICAL APPLICATION:

a) Take the proper wrenches and check every nut and bolt on your bicycle for tightness. Tighten anything that needs tightening. ___

b) Find a bike of a friend or acquaintance and get his permission to check the nuts and bolts for tightness. When you have his/her permission, repeat a) above to tighten the nuts on the bicycle. ___

18. PRACTICAL APPLICATION:

- a) Give your bike a general maintenance check-up. Check the valve stems, chain, handlebars, seat, light and other accessories for proper adjustment. Adjust any part that needs adjustment. _____
- b) Do the above general maintenance on a second bicycle. Be sure to get permission from the owner of the bike before you begin. _____

19. DEFINE: friction _____ spoke _____

*20. READ: DS #2180 General Bicycle Lubrication. _____

21. DEMONSTRATE (with objects): Why moving bicycle parts need to be lubricated. _____

22. PRACTICAL APPLICATION:

- a) Lubricate all moving parts of your bicycle with a light lubricating oil. Take DS #2180 with you and follow instructions step by step to completely lubricate your bicycle. Be sure to clean up any spilled oil drips from your bike or the ground below it. _____
- b) Repeat step a) on another bicycle which you have permission to use. _____

*23. READ: DS #2183 Bicycle Storage and Tune-Up. _____

24. DEMONSTRATE: The purpose of each of steps 1–8 given in the above data sheet. _____

25. PRACTICAL APPLICATION: Follow the instructions in the above data sheet to give your bicycle a tune up (steps 1–6). Repeat this action on someone else’s bike (with the owner’s permission). _____

C. BICYCLE TRIPS

1. DEFINE: topographical _____

*2. READ: DS #2184 Taking Bicycle Trips. _____

3. DEMONSTRATE: Get a good road map of your area. A topographical map is best. Locate yourself on the map then clear the meaning of all the symbols on the map (see the legend on the map). Find three places on the map that you would like to go to. Choose places that are several miles away and determine the distance of these places from your location. Now compute how long it would take you to get there travelling 10 mph (speed in mph = distance in miles ÷ time in hours). _____

4. DEMONSTRATE: Get the tools you will need to put together a tool kit for a day trip (tools listed 1–5 in DS #2184). Put these tools together in a carrying pack that will be convenient to carry. _____

5. PRACTICAL APPLICATION: Before completing this course, plan and take a bicycle trip. Locate on a map a place where you will go and have the place be at least 10 miles there and back. Make all the necessary preparations before you leave and be sure to take your tool kit and a map. _____

D. OVERHAULING A BICYCLE

1. DEFINE: overhaul _____ grease _____ axle _____
2. READ: DS #2182 Bicycle Overhauls. _____
3. DEMONSTRATE (with objects):
- a) How you can tell if a bicycle needs an overhaul. _____
 - b) What can happen to a bike if it goes too long without an overhaul. _____
4. PRACTICAL APPLICATION:
- a) Check each major bearing of your bicycle for signs that your bike needs an overhaul and decide if your bike needs one. _____
 - b) Repeat a) above for several bicycles. Test enough bicycles so that you have found at least one major bicycle bearing that needs an overhaul. _____
5. DEFINE: washer _____ kerosene _____
- *6. READ: DS #3193 Overhauling a Bicycle Front Wheel Hub (just read it for now). _____
7. DEMONSTRATE: Locate on your bicycle the hub, wheel, nut, lock nut and bearing cap nut. _____
8. DEMONSTRATE (with objects): The purpose of overhauling a bicycle front wheel bearing. _____
9. PRACTICAL APPLICATION: Re-read DS #3193 and do each step as you read it to overhaul the front wheel bearing of your bicycle. _____
10. DEFINE: shank _____ column _____
- *11. READ: DS #3194 Overhauling a Bicycle Steering Bearing (just read it for now). _____
12. DEMONSTRATE: Locate on your bicycle the steering column, steering fork bolt, handlebar shank, lock nut, grease cap nut and steering forks. _____
13. DEMONSTRATE (with objects): The purpose of overhauling a bicycle steering bearing. _____

14. PRACTICAL APPLICATION: Re-read DS #3194 and do each step as you read it to overhaul the bicycle steering bearing on your bicycle. _____
15. DEFINE: sprocket ____ crank ____ _____
- *16. READ: DS #3195 Overhauling a Bicycle Crank Bearing. _____
17. DEMONSTRATE: Locate on your bicycle the crank, crankcase, sprocket, lock nut and bearing seat nut. _____
18. DEMONSTRATE (with objects): The purpose of a bicycle crank bearing overhaul. _____
19. PRACTICAL APPLICATION: Re-read DS #3195 and do each step as you read it to do a bicycle crank bearing overhaul on your bicycle. _____
20. PRACTICAL APPLICATION: Give an overhaul to another bicycle (one you found earlier that needs an overhaul). Get permission from the owner before you begin and work out a suitable exchange for your service. _____

I have completed the steps of this course. I understand what I studied and can use it. (Save all your written work to take to the examiner.)

Student _____ Date _____

The student has completed the steps of this course and knows and can apply what was studied.

Supervisor _____ Date _____

This student has passed the exam for this course.

Examiner _____ Date _____

12 March 1979 Revised 13 August 2001 © 2001, Northwest Research, Inc. ALL RIGHTS RESERVED
