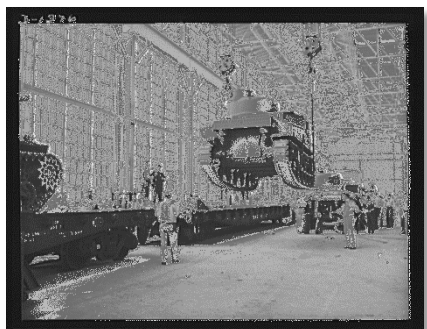




DETROIT: THE “ARSENAL OF DEMOCRACY”

RESEARCH PROJECT GUIDELINES

During World War II, Detroit adapted its factories to produce airplanes, tanks, vehicles, boats, weapons, ammunition, electronics, clothing, food – everything necessary to assist the military efforts at home and overseas. The people of Detroit and the manufacturing might of southeast Michigan produced 30% of the war products generated by the United States before the end of World War II in 1945.



Chrysler Corporation's Warren Tank Arsenal, c. 1942. From the Library of Congress

It took cleverness and determination under difficult circumstances, but Detroit came through to lead the country. Detroit industry leaders worked closely with the War Department. Detroit engineers designed materiel and methods of production that sped needed arms and armament to troops, and saved America millions of dollars. Detroit assembly line workers provided the muscle, and Detroiters of all ages pitched in to make the industrial war machine operate smoothly.

While Detroit helped change the character of the war, the war had significant impact on the city as well. More than 700,000 residents toiled in factories – many for the first time. People came from all over the country to fill job vacancies. The burgeoning population put a strain on municipal services, while overwork, overcrowding and rationing put a strain on the people. Nevertheless, victory despite adversity was a source of pride for all Detroiters.

The goal of *Detroit: The “Arsenal of Democracy” Research Project* is to collect and share information on all of the factories in Detroit that produced materials for the war. While information on the war time production of “Big Three” automakers – Chrysler, Ford and GM – is readily available for the general public in books and on websites, less is known about the hundreds of smaller factories that produced the parts, ammunition, and other materials for the war effort.

The Detroit Historical Society is looking for high school students to help research these factories. In this year-long project, students will not only develop important research, writing, time management and critical thinking skills, but their original research will be showcased on an interactive web-based map that will be viewed by historians and the general public.

The research project works as follows:

1. Individuals or small groups of students pick a Detroit factory from a list of those that produced war materials.
2. The students spend several months researching their factory using books, the internet, libraries, museums and archives in order to answer these questions:
 - a. Who owned the factory?
 - b. When was it built?
 - c. What did they make before the war?
 - d. What did it make during the war?
 - e. How was their product used during the war? Where was it used?
 - f. Is the factory still in business? If not, when did it close?
 - g. What is at the factory location today (Vacant lot? Old building? Working factory?)
3. The students also collect photographs, letters, advertisements, business cards, posters and other primary sources related to their factory.
4. The students create a tri-fold exhibit board that talks about their factory before the war, during the war and after the war using the photographs and images they gathered.
5. Finally, they compile all of their research and findings and send it to the Detroit Historical Society, where it will be added to an interactive web-based map dedicated to providing new information about World War II war production.

FACTORY LIST

The list below includes most of the factories operating in Detroit, Highland Park or Hamtramck during the war. Choose a factory from this list and let the Detroit Historical Society know which one you have chosen. You may choose a factory not on this list as long as it was operating before the war and retooled to make war products during World War II.

FACTORY	ADDRESS	CITY	WHAT THEY MANUFACTURED
Aeronautical Products Inc.	18100 Ryan Road	Detroit	Aircraft engine shafts, stems, bushings and valves
American Metal Products Company	5959 Lynsdale	Detroit	Wrought pipes, axle housings, nacelles, B-24 engine mounts
American Radiator and Standard Sanitary Company, American Blower Company	8007 Jos Campau	Detroit	Hydraulic couplings for fluid drives, marine blowers
Apex Broach Company Inc	2981 E Lafayette	Detroit	Broaching tools
Arrow Tool and Reamer Company	418 Livernois	Detroit	Reamers
Asam Manufacturing Company	2154 Scott	Detroit	Machine tool parts
Bower Roller Bearing Company	3040 Hart	Detroit	Crankshaft roller bearings for aircraft engines

FACTORY	ADDRESS	CITY	WHAT THEY MANUFACTURED
Briggs Manufacturing Company	11631 Mack	Detroit	Airplane equipment: B-26c doors, B-26c bulkheads, A-20g outer wings, A-20g wing tips, A-20g ailerons, B-17g outer wings, B-17g wing tips, B-17g stabilizers, B-17g fins, B-17g ailerons, B-17g flaps, B-17g ducts, B-29 flaps, T-36-90 and 26-105 tank hulls, B-29 aft bomb doors, B-29 forward bomb doors, B-29 nose wheel doors, tools, dies, fixtures, truck, cabs and tops, tank hulls, aircraft gun turrets
Budd Wheel Company	12141 Charlevoix	Detroit	Rocket fuses, 155mm shells, brake drums, truck wheels
Bundy Tubing Company	10951 Hern	Detroit	Tank tread tubing, aircraft tubing, glider tubing
Burroughs Adding Machine Company	6005 2nd	Detroit	Office and store machines, M-9 norton bombsights
Cabot Carbon Company			Thread ring gauges, thread plug gauges
Castoloy Corporation	197 S Waterman	Detroit	Tools, dies, jigs, fixtures, special patented tools for aircraft
Champion Spark Plug Company	8525 Butler	Detroit	Potter aircraft and tank spark plugs, other spark plugs, insulators for spark plugs
Chicago Pneumatic Tool Company	6201 2nd/ 570 E Larned	Detroit	Pneumatic hydraulic and electric tools
Chrysler Kercheval Plant	12262 Kercheval	Detroit	Engines and turbines, 40mm anti-aircraft guns, marine tractors
Chrysler DeSoto Plant	9400 McGraw	Detroit	Engines and turbines, SB 2C-1 aircraft center wing assemblies, B-29 aircraft nose and center fuselage, B-26 aircraft nose and center fuselage, B-29 engine cowlings, horizontal truss tubes
Colman Frederick and Ons Incorporated	7250 Central	Detroit	Jigs, tools and fixtures
Colonial Broach Company	147 Jos Campau	Detroit	Broaching machines
Continental Die Casting Company	9615 Grinnell	Detroit	" AP shot, 4.5" T-22 and T-46 rockets
Continental Motors Corporation	12801 E Jefferson	Detroit	Aircraft and parts, tank engines, R-975 aircraft engines, combat vehicle motors
Cross Gear and Machine Company	3250 Bellevue	Detroit	Milling, boring, gear chambering and burring machines
Dalzen Tool and Manufacturing Company	511 Leib	Detroit	Thread grinders, ground thread taps, tools, broaches
Detroit Broach Company Inc.	6000 Beniteau	Detroit	Broaching tools
Detroit Brass & Malleable Works	100 S Campbell	Detroit	Boosters
Detroit Cutboard Products Corporation		Detroit	Tank track end connectors
Detroit Diesel Engine Division	13400 W Outer Drive	Detroit	Marine diesels and spare parts, tank diesel engines
Detroit Gear - Aircraft Parts Division		Detroit	Aircraft valve tappets, guides, rollers, piston parts
Detroit Gear - Machine Division	606 Woodbridge/12345 Kercheval	Detroit	Synchronized reverse transmissions, marine reduction gears, oil and water pumps, motor truck transmissions, service & distributor gears
Detroit Harvester Company	5440-5450 W Jefferson	Detroit	Machine shop products, aircraft engine parts
Detroit Lubricator Company	5900 Trumbull	Detroit	Armor plate
Detroit Reamer and Tool Company	6527 Russell	Detroit	Drills, high speed reamers, special cutters

FACTORY	ADDRESS	CITY	WHAT THEY MANUFACTURED
Detroit Transmission Division	5140 Riopelle	Detroit	Hydraulic transmissions for armored cars, hydraulic transmissions for tanks
Detroit Universal Duplicator Corporation	253 St Aubin	Detroit	Machine tool controls
Differential Wheel Corporation	5124 Braden	Detroit	Tank bogie wheels, differential dual wheels, track support roller wheels
Eaton Manufacturing Company - Spring Division	9771 French	Detroit	Volute springs for track suspension assembly
Eclipse Counterbore Company	7410 St Aubin	Detroit	Cutting tools
Eureka Vacuum Cleaner Company	6060 Hamilton	Detroit	Training gas masks, non-combatant masks
Ex-cell-o Corporation	5835 Martin	Detroit	Nozzle plates for rockets, aircraft engine parts, boring machines, thread, grinders, center lapping machines
Federal Mogul Corporation	11031 Shoemaker	Detroit	Aircraft engine valves, bearings, cam rings, oil seal parts, marine propellers
Federal Screw Works	3401 Martin	Detroit	Bolts, nuts, washers and rivets, screw machine products, projectiles, fuses, boosters
Ford Motor Company Lincoln Plant	6200 W Warren	Detroit	Aluminum dismantling, freight and install charges on transferring tank engine equipment, V8-model GAA engines, V 12-British tank engines
Gemmer Manufacturing Company	6400 Mt Elliott	Detroit	Gun turret forms, 40mm shot, steering gear assemblies; worm gears for turret
Graf V L Company	9456 Grinnell	Detroit	Aircraft fittings
Graham Paige Motors Corporation	8505 W Warren	Detroit	Articulating rods, connecting rods, cylinder heads, valve assemblies, cartridge guide plates, operating levers, breech housing for machine guns
Greenfield Tab and Die Corporation	2102 W Fort	Detroit	Ground thread high speed taps
Holley Carburetor Company	8279 Epworth	Detroit	Carburetor fuses, aircraft engine carburetors
Huck Manufacturing Company	2480 Bellevue	Detroit	Aluminum rivets
Hudson Motor Car Company	12601 E Jefferson/10865 Devine	Detroit	B-29 sub-assemblies, P-38 outer wing panels, P-38 cabins, SB2C-3 outer wings, rocker arms, pistons, marine gasoline engines, 37mm shot
Hupp Motor Car Company	3641 E Milwaukee	Detroit	Base plugs for bombs and tank components
Jacobs Aircraft Engine Company	1043 Spruce	Detroit	Amphibious tank tracks, volute spring suspensions, M4 tanks
Kelsey-Hayes Wheel Company	3600 Military	Detroit	Road wheel assembly parts, track supporting roller parts, volute spring suspensions and parts, M-7 tank, tank track end connectors, universal carriers and parts, automatic type hub wheels, brakes and parts, aircraft parts, steel aim and disc assemblies, 3" shells, 4" shells
Long Manufacturing Division	12501 Dequindre	Detroit	Ordnance material
Lyon Inc.	151 S Waterman	Detroit	40mm cartridge cases
McCord Corporation	2587 E Grand Blvd	Detroit	Rifle shell bodies, bomb suspension bands, steel helmets, link loading machines, automotive parts
McLaren Screw Products Company	514 15th	Detroit	Screw machine products, fuses
Michigan Die Casting Company	11831 Charlevoix	Detroit	20mm cartridge cases
Michigan Steel Casting Company	1986 Guoin	Detroit	Wrought pipe, steel castings

FACTORY	ADDRESS	CITY	WHAT THEY MANUFACTURED
Michigan Steel Tube Products Company	9450 Buffalo	Detroit	Wrought pipe, seamless steel tubing for aircraft
Michigan Tool Company	7171 E McNichols	Detroit	Cone worm gears
Micromatic Hone Corporation	1345 E Milwaukee	Detroit	Honing machines, tools, fixtures, abrasive products, cutting tools and parts
Midwest Tool and Manufacturing Company	2360 W Jefferson	Detroit	Metal cutting tools
Motor Products Corporation	11801 Mack	Detroit	B-24 rear gun turrets, 20mm cartridge cases, bushings for tank suspensions, vehicle parts
Motor Tool Manufacturing Company	12281 Turner	Detroit	Metal cutting tools
Murchee Machine and Tool Company	951 Porter	Detroit	Machine tools, small tools, chasers and parts
Murray Corporation of America	7700 Russell	Detroit	Automobile parts, B-17 F outer wings, P-47 G outer wings, B-17 F wing tips, B-24 aircraft subassemblies, ailerons, searchlights, military chasses frames, P-61 gun turrets
Nash Kelvinator Corporation	14250 Plymouth	Detroit	Helicopters, R-6 aircraft propellers and propeller governors, bomb fuses
National Tool Salvage Company	3816 Beaubien	Detroit	Machine shop repairs, salvage of tools and cutters
National Twist Drill and Tool Company	6522 Brush	Detroit	Milling cutters and reamers
Packard Motor Car Company	1580 E Grand Blvd	Detroit	PT boat marine engines, aluminum castings, V-1650 aircraft engines
Parker Wolverine Company	5230 Martin/2177 E Milwaukee/ 2531 Scotten	Detroit	Steel cups for 45 caliber bullet jacket
Plymouth Steel Company	6134 Epworth	Detroit	Cold drawn alloy bar steel
Putnam Tool Company	2981 Charlevoix	Detroit	Metal cutting tools
Rafco Tool and Manufacturing Company	7350 Central	Detroit	Ordnance material
Redford Tool and Die Company	17170 Rockdale	Detroit	20mm automatic aircraft cannon parts
Republic Aircraft Products Division	5914 Federal	Detroit	Aircraft engine toppers, guides, rollers, valve locks, seats, aircraft engine parts
Revere Copper & Brass Inc.	5851 W Jefferson	Detroit	Sheets, strips, bands, cartridge cases, cups
Rotary Electric Steel Company	21400 Mound	Detroit	Hot metal for electric furnaces
S and S Tool and Manufacturing Company	3683 Willis	Detroit	Machine tools, gun, tank and airplane parts
Sal Way Steel Treating Company	620 W Elizabeth	Detroit	Heat treating of cutting tools and small parts
Shatterproof Glass Company	4815 Cabot	Detroit	Glass products, broaches
Sherwood Brass Works	6331 E Jefferson	Detroit	Water pumps and parts
Sperry Corporation, Vickers Inc.	1400 Oakman	Detroit	Hydraulic equipment
Steel Materials Corporation	17260 Gable	Detroit	20mm steel cartridge cases
Ternstedt Manufacturing Division	6307 W Fort	Detroit	Horizontal gyros, vertical gyros, remote compasses
Timken Detroit Axle Company		Detroit	Axles, transfer cases, service parts for military and commercial trucks
Tompkins Printing Equipment Company	545 W Larned	Detroit	Aircraft cup screws, bolts and turn buckles; screw machine products
Tungsten Carbide Tool Company	7171 E McNichols	Detroit	Hard alloyed production tools
U S Broach Company	6463 E 7 Mile	Detroit	Broaches, reamers, form tools

FACTORY	ADDRESS	CITY	WHAT THEY MANUFACTURED
U S Rubber Company	6600 E Jefferson	Detroit	Plastic steering wheels, rubber cement, airplane engine mountings, truck vibration dampers, self-sealing fuel cells, fuel cell fittings, tires, tire flaps, aircraft antenna masts, cemented tire fabrics
United Drill and Tool Corporation	2108 W Fort	Detroit	Twist drills, reamers, countersinks, counterbores, special cutting tools
Vinco Corporation	8855 Schaefer/9111 Schaefer	Detroit	Hardened and ground tools and gauges, precision checking and production instruments, special machinery
Welch Industries Inc.	19400 W Eight Mile	Detroit	Machine tools, milling cutters, reamers, drills, flat, circular and dove-tail form tools
Wolverine Tube Company	1425 Central	Detroit	Alloying condenser tubes
Woodall Industries Inc.	7565 E McNichols	Detroit	B-26 landing gear doors, F4U-1 aft fuselage sections
Young L A Spring & Wire Corporation	9200 Russell	Detroit	75mm projectiles, 20mm projectiles, 20mm links, 37mm links, gun parts, 90mm shells
Chrysler Dodge Bros Main Plant	7900 Jos Campau	Hamtramck	Metal working equipment, Mark XIV gyro compasses, aluminum castings, aluminum forgings. 40mm anti -aircraft guns, gear boxes, radar components
Gear Grinding Machine Company	3901 Christopher	Hamtramck	Machine tools
Ex-cell-o Corporation	1200 Oakman	Highland Park	Aircraft engine parts
Ford Motor Company	Woodward	Highland Park	M 5-AA directors, M 7-AA directors, cams and gears for M-7 directors, engine parts for Ford arbinal tanks-M4, M4 gun motor carriages
Detroit Tap and Tool Company	8432 Butler	Hamtramck	Ground form taps, gauges, hobs, cutting tools, marine engine gears
Chrysler Highland Park Plant	841 Massachusetts	Highland Park	40mm anti-aircraft guns, gun mechanisms, multi-bank tank motors, military truck and parts, SB 2C 1 center wing assemblies, B-29 aircraft nose and center fuselage

RESEARCHING YOUR FACTORY

Follow these simple steps to start your research about your factory. Please see the Student Handbook and Selected Bibliography documents for more information on conducting historical research.

1. Start with a simple web search for your factory name. See what information is available for your factory, like its full name, its owners, its location, the year it was built, what it made before, during and after the war and so on.
2. Using the internet or books on World War II, learn about the different products your factory made. Note how the products were made and how they were used.
3. Look for primary sources (photographs, letters, government documents, business cards, etc.) about your factory using some good online collections databases:

- a. Detroit Historical Society Digital Collection: <http://detroiths.pastperfect-online.com/33029cgi/mweb.exe?request=ks>
 - b. Walter P. Reuther Library Virtual Motor City: <http://dlxs.lib.wayne.edu/cgi/i/image/image-idx?c=vmc;page=index>
 - c. Library of Congress, Farm Security Administration/Office of War Information Color Photographs: <http://www.loc.gov/pictures/collection/fsac/>
 - d. Archives of Michigan, Seeking Michigan: <http://seekingmichigan.org/>
4. Contact or visit these (and other) libraries to see what material they have on your factory:
- a. Archives of Michigan: http://www.michigan.gov/dnr/0,1607,7-153-54463_54475_51697---,00.html
 - b. Burton Historical Collection, Detroit Public Library: <http://www.detroit.lib.mi.us/featuredcollection/burton-historical-collection>
 - c. National Automotive History Collection, Detroit Public Library: <http://www.detroitpubliclibrary.org/branch/national-automotive-history-collection>
 - d. Walter P. Reuther Library, Wayne State University: <http://www.reuther.wayne.edu/>
 - e. Bentley Historical Library, University of Michigan: <http://bentley.umich.edu/>
 - f. Clarke Historical Library, Central Michigan University: <https://www.cmich.edu/library/clarke/Pages/default.aspx>

Are you hitting a dead-end with your factory? Many of the factories on the list were so small that information about them may be very difficult to find. If you are having difficulty finding resources, you may want to consider starting over with a different factory.

FACTORY EXHIBIT

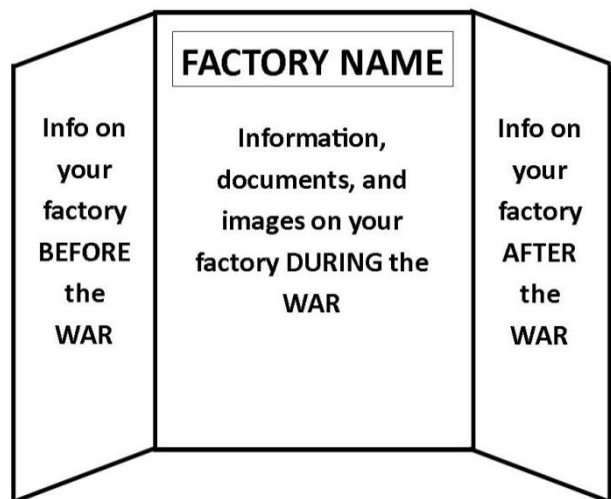
Once you have completed your research on your exhibit, it is time to make a tri-fold exhibit board that shows your findings.

It's fairly simple. You just use your information and primary sources to create an exhibit board that is laid out like the illustration to the right.

Check the Student Handbook for some tips on how to make an attractive and informative exhibit.

Here are the rules for the exhibit board:

1. **Size Requirements:** You should use a standard tri-fold board, or two pieces of poster board to make your exhibit.



- 2. Word Limit:** Exhibit text you write yourself is limited to 500 words. This includes the text you write for titles, subtitles, captions, graphs, and any other place where you use your own words. Quotations or brief citations crediting the sources of photos or illustrations do not count toward the 500-word limit.
- 3. Construction of Entry:** You are responsible for the research, design, and creation of your exhibit. You may receive help and advice from teachers and parents on creating your entry, but the work must be your own.

FINAL RESEARCH REPORT

At the end of your research project, you must submit a research report to the Detroit Historical Society, who will use it to add your information to their website, creating an informative map of Detroit factories during World War II.

SUBMISSION CHECKLIST

The following documents and resources should be submitted to the Detroit Historical Society at the end of your project.

- Factory Information Form (included at the end of this guide)
- Factory Essay
- Bibliography
- Primary source material (either digitally on a CD or printed at a high resolution on paper)

Information about each of the components is below.

Factory Information Form

This form helps us gather the facts about your factory in an easy way. It also lets us know how you'd like to be credited for your research on the website.

Factory Essay

This 500-word essay helps us understand the process you used to conduct your research. You do not need to write a full research paper on your findings. Instead, let us know about your research by answering these four questions:

1. Why did you choose your factory?
2. How did you conduct your research? Let us know where you started, how you kept track of your sources, and where you found the most important information.

3. What was easy and what was difficult about researching your factory?
4. Why was your factory important during World War II?

See the Student Handbook for more information on writing your essay.

Bibliography

It's important for us to know where you found your research. Your bibliography is a list of sources that you used. It will also let us know where you found your primary sources, so that we can get permission to post them on our website. Your bibliography should be separated by primary and secondary sources and follow the MLA format.

Primary Source Material

We want to put as many images and documents about your factory on to the website as possible. We prefer that you send us your primary sources in digital form, on a CD-ROM or flash drive. If this isn't possible, we will be glad to take paper copies of your sources. Please make sure they are high quality, so that we can scan them and put them online.

SENDING IN YOUR FINAL PROJECT

Once you have gathered all the items on the final project checklist, send them to:

Detroit Historical Society
c/o Tobi Voigt
5401 Woodward Avenue
Detroit, MI 48202

You may also bring your final project to the Detroit Historical Museum and leave it at the front desk during our open hours. Make sure it is clearly addressed to Tobi Voigt. The museum is located at the address above. It is open Tuesday – Friday, 9:30am – 4:00pm and Saturday and Sunday, 10:00am – 5:00pm.

QUESTIONS?

Do you have questions about the project or its guidelines? Contact

Tobi Voigt, Chief Curatorial Officer
Email: tobiv@detroithistorical.org
Phone: 313-833-0481

FACTORY INFORMATION FORM

Submit this form along with your research essay and all primary source information at the end of your project.

YOUR INFORMATION	
School:	
School Address (city, state, zip):	
Teacher Name:	Teacher Email:
Student 1:	Grade:
Student 2:	Grade:
Student 3:	Grade:
Student 4:	Grade:
Student 5:	Grade:
<input type="checkbox"/> By checking this box, I give permission for the Detroit Historical Society to post my/our original research on their website.	
Please check the credit format you would prefer for student work posted on the website:	
<input type="checkbox"/> Full student names, teacher name, school name	
<input type="checkbox"/> Student first names and last initial only, teacher name, school name	
<input type="checkbox"/> Teacher name, school name ONLY	
<input type="checkbox"/> School ONLY	
<input type="checkbox"/> Other: _____	
YOUR FACTORY INFORMATION	
Name of factory:	
Location:	Owner:
Year it was built:	Year that it closed:
What is at its location today?	
What did the factory make before the war? _____ _____ _____	

What did the factory make during the war? (List items separately.)

Product 1: _____
Product 2: _____
Product 3: _____
Product 4: _____
Product 5: _____

What were the products used for during the war?

Product 1: _____
Product 2: _____
Product 3: _____
Product 4: _____
Product 5: _____

What did the factory make after the war?

PRIMARY SOURCE CHECKLIST:

Using web resources, libraries and archives, try to find as many of these primary sources as possible:

Photographs:

- Outside of the factory – before the war
- Outside of the factory – during the war
- Outside of the factory – after the war
- The factory location – present day
- Inside of the factory – before the war
- Inside of the factory – during the war
- Inside of the factory – after the war
- Workers in the factory
- Other: _____

War Products:

- Images of the items the factory made (photos, diagrams or illustrations)
- User and/or repair manuals for the products
- Images or video of the products in use during the war
- Other: _____

Stationery and Business Materials:

- Letterhead and envelopes
- Advertisements
- Order forms and invoices
- Production schedules and/or lists
- Account books
- Other: _____

Government Relations:

- Letters or documents from or to the government
- Awards (like “E” for Excellence)
- Other: _____

Labor Relations:

- Letters or documents from or to workers
- Time cards
- Other: _____