10 FRED® Activities in 10 Minutes

TOOLS for **TEACHING**
with **FRED®**

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Introduction

This guide takes you through 10 step-by-step activities on FRED®, the free online economic database of the Federal Reserve Bank of St. Louis, to show how quickly and easily you can find and graph economic data and save and share them as a custom graph.

The FRED® database includes more than 823,000 economic data time series from dozens of national, international, public, and private sources. FRED® allows you to combine and display data with an easy-to-master mix of tools. With just a few minutes of practice, anyone can use FRED® to tell a story using data.

Activities

The dataset used for these activities is real gross domestic product (GDP).

1. **Find Real GDP (Series ID: GDPC1)**

    *   Real GDP is the total market value of all final goods and services produced in an economy in a given year calculated by using a base year's price for goods and services. The U.S. Bureau of Economic Analysis (BEA) reports this key indicator every three months.

    *   First, start by navigating to the FRED® website: https://fred.stlouisfed.org/. Or just search the Internet for FRED®. Select the link that says "Federal Reserve Economic Data—FRED®— St. Louis Fed." It will probably be the first link on the list.

    *   In the search bar at the top of the FRED® home page, type "real GDP" and press "Enter" or click the magnifying glass icon (Figure 1). A page of search results will appear (Figure 2).
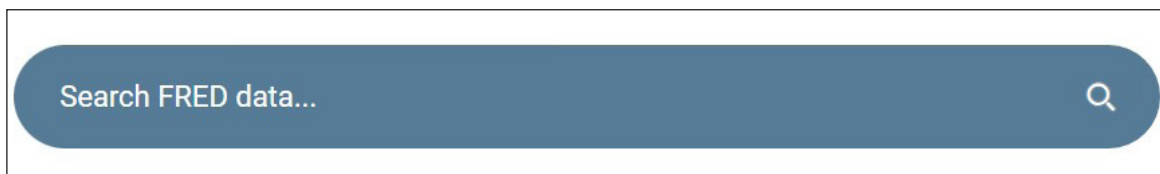

Figure 1

- Click on "Real Gross Domestic Product" (Figure 2A). FRED® automatically creates an up-to-date line graph of U.S. real GDP measured in billions of chained 2017 dollars (Figure 3).

- Note that FRED® displays key metadata for the series at the top left of the graph (Figure 3A), including the last observation value and its date, the units and whether the data are seasonally adjusted, and the frequency.

(**NOTE:** The FRED® graphs you are viewing online represent the most current data available, so they have more recent dates than those shown in the sample figures here.)
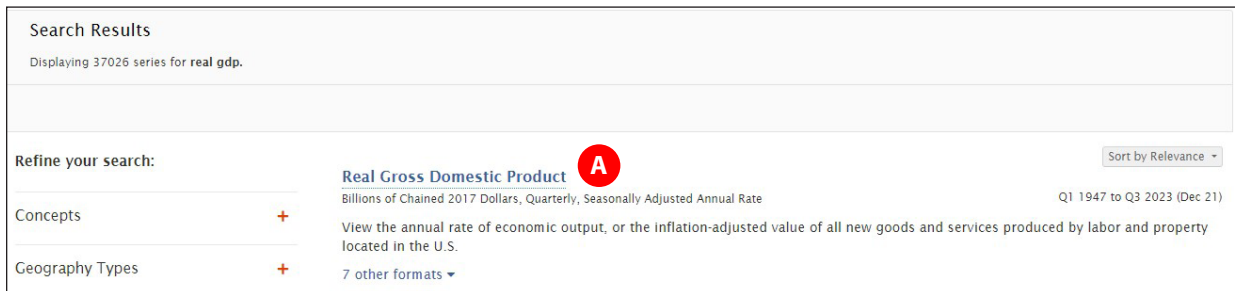

Figure 2

Figure 3

2. Shorten the Graph Date Range by Clicking the "10Y" Setting

Note that FRED® created a graph of real GDP with dates ranging from 1947 through the latest reported data. The beginning and ending dates of the observation period are noted in the boxes on the top right of the graph (Figure 3B). You can customize the graph's date range with a variety of tools. Let's use the simplest tool to narrow the real GDP graph to the past 10 years of data.

- Click the "10Y" tab at the top of the graph (Figure 4A). FRED® updates the graph automatically, displaying the past decade's data. The beginning date window updates, too, confirming the new date range (Figure 4B).
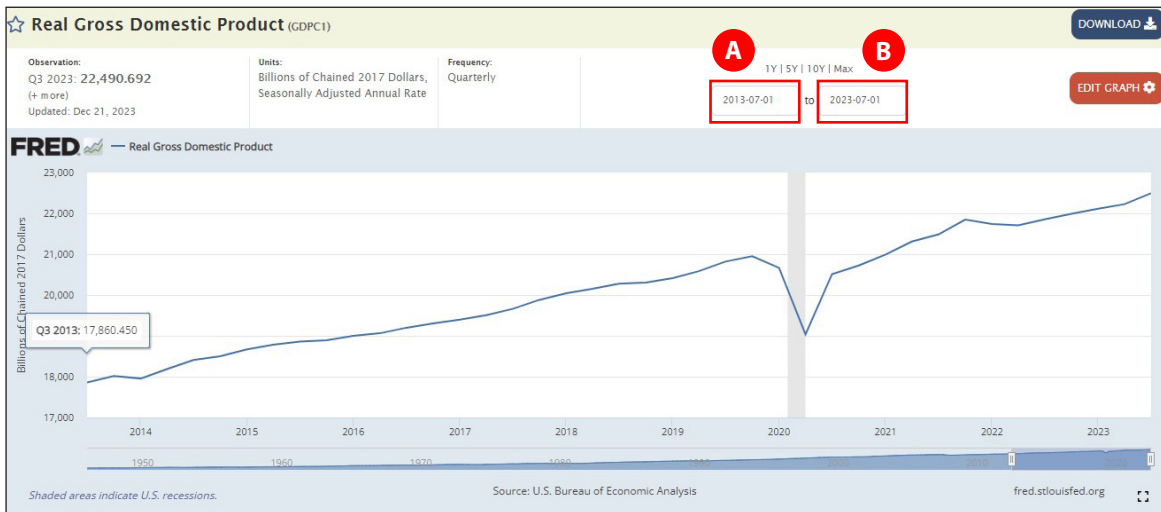

Figure 4

3.   Mouse Over Any Point on the Line to View Values

By default, FRED®'s tooltip feature is active. Move the mouse cursor along the plot line on the graph and each value along the line will show in a box (Figure 5A).

- To deactivate the tooltip, click the red "EDIT GRAPH" button at the top right of the graph (Figure 5B).

- In the panel that opens, click the "FORMAT" tab (Figure 6A) and then uncheck the "Tooltip" box (Figure 6B). (Note that this tab also houses the controls that modify the graph's size and color.)
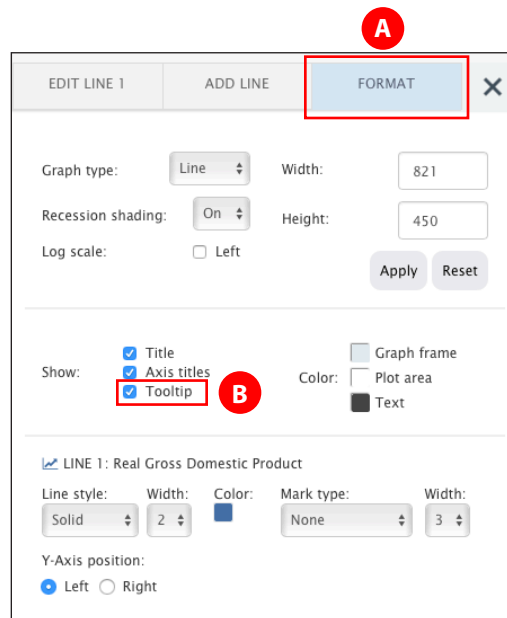

Figure 5

Figure 6

4.   Convert the Graph from a Line Graph to a Bar Graph

With FRED®, line graphs are just the beginning.

- In the "EDIT GRAPH" panel, in the "FORMAT" tab (Figure 7A), click the "Graph type" drop-down menu (Figure 7B) and select "Bar." The data automatically convert to a bar graph (Figure 7C). Note that the Graph type menu also includes area, scatter, and pie graphs.
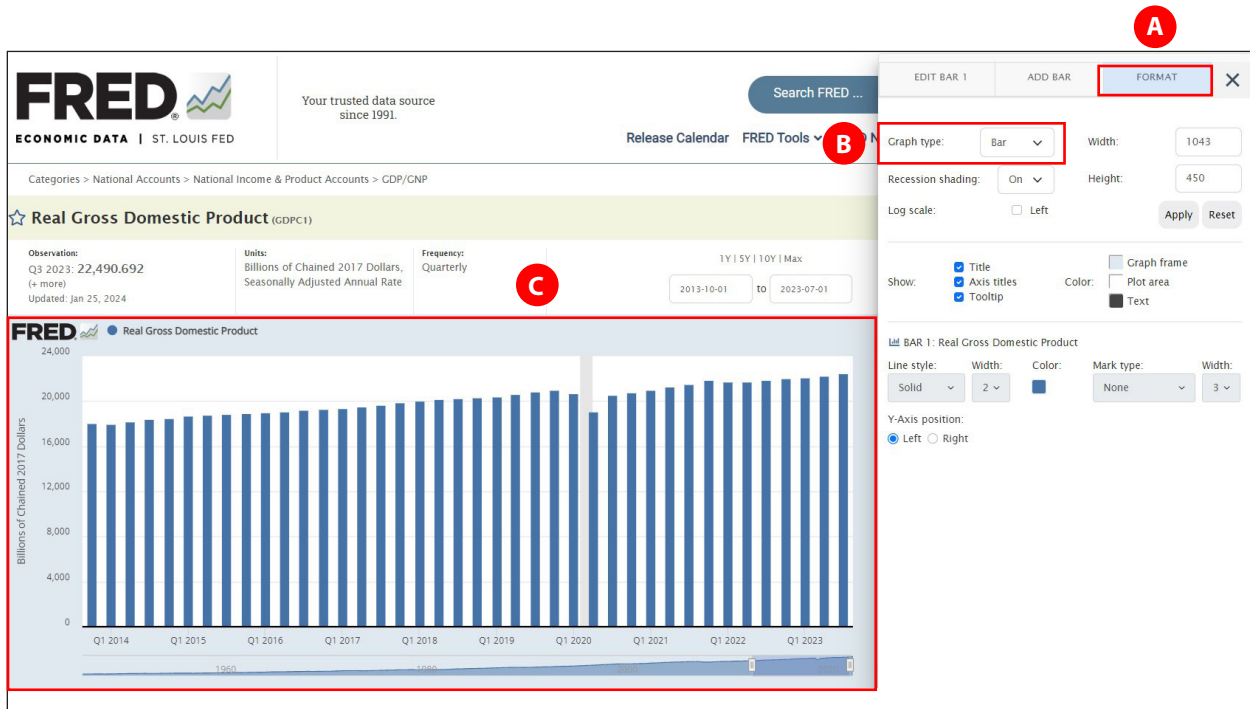

Figure 7

5.   Transform the Graph Frequency from Quarterly to Annual

Quarterly real GDP growth is informative, but what if you want to show annual levels? You can easily modify the frequency shown.

- In the "EDIT GRAPH" panel, click the "EDIT BAR 1" tab (Figure 8A).

- Click the "Modify Frequency" drop-down menu (Figure 8B) and select "Annual." FRED® automatically aggregates quarterly data values, averaging them into annual values.
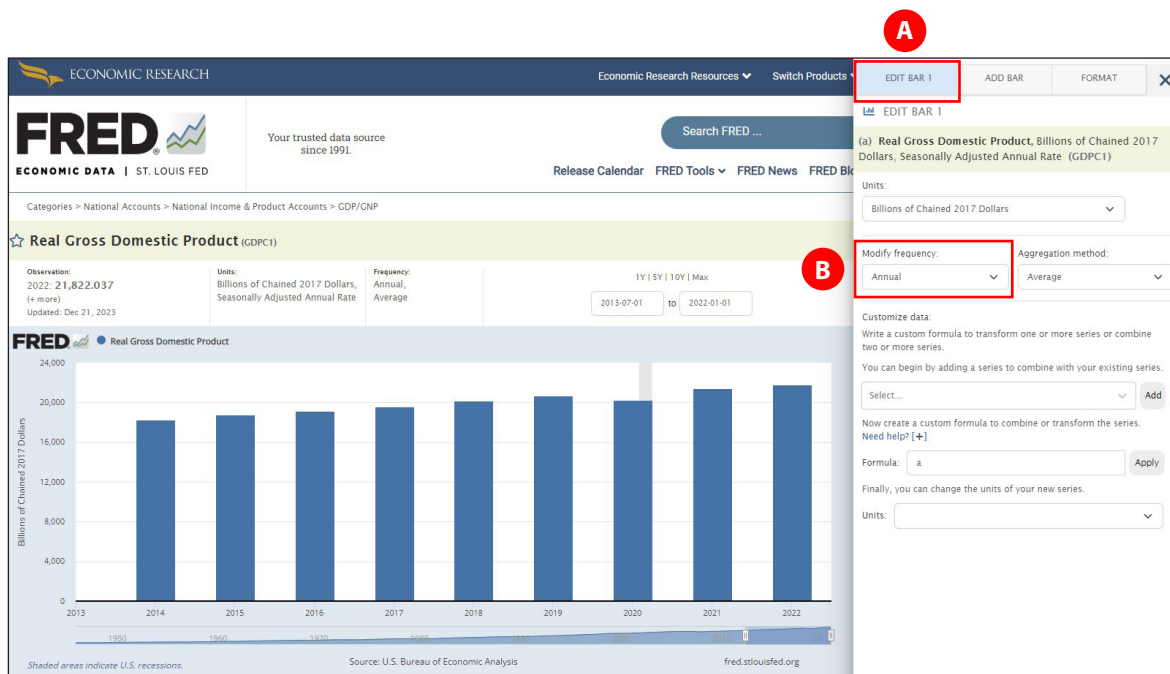

Figure 8

6.   Change the Units from Billions of Chained 2017 Dollars to a Compounded Annual Rate of Change

Up to this point, the GDP data displayed by FRED® have consisted of real values reported in billions of chained 2017 dollars. Using a measure of dollars from a base year allows year-to-year comparison without distortions resulting from changes in the overall price level (inflation). More commonly, however, real GDP is reported in terms of the annual percentage growth rate rather than inflation-adjusted dollars. FRED® makes this data transformation easy, too.

- In the "EDIT GRAPH" panel, in the "EDIT BAR 1" tab (Figure 9A), click the "Units" drop-down menu (Figure 9B) and select "Compounded Annual Rate of Change" (Figure 9B). The newly transformed graph now displays GDP's compounded annual growth rate, adjusted for inflation (Figure 10).
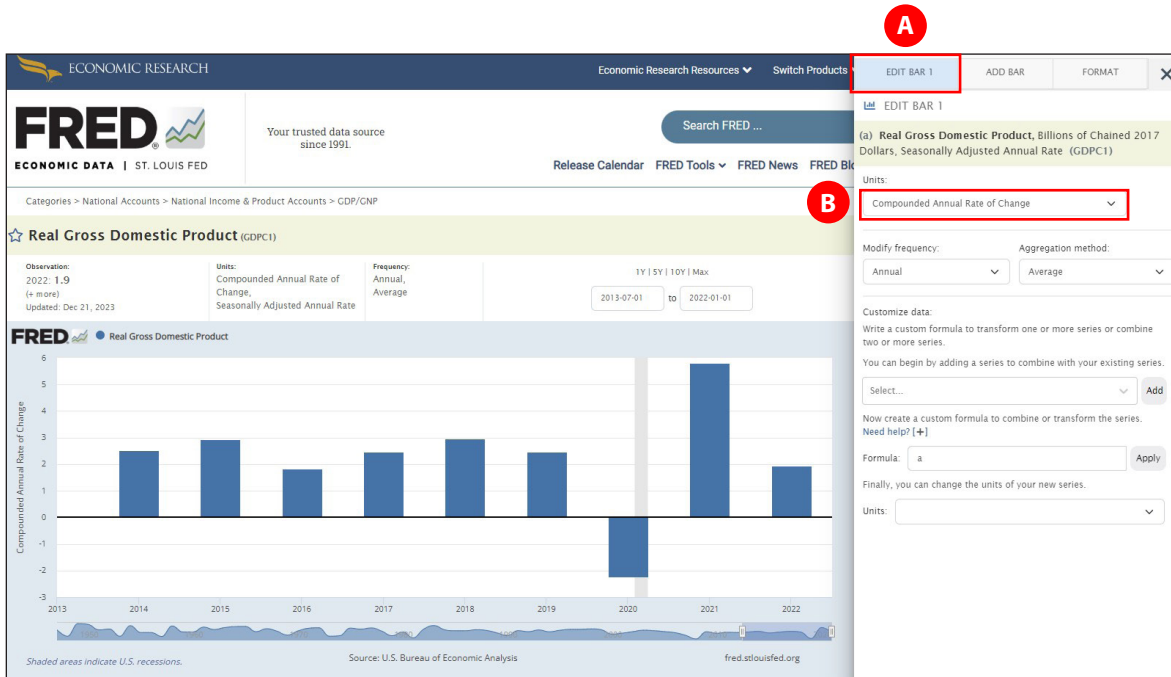

Figure 9

Figure 10

7.   Change the Graph Color

This next activity is more cosmetic than macroeconomic. FRED® allows you to customize the color of the graphed element.

- In the EDIT GRAPH panel, click the "FORMAT" tab (Figure 11A).

- Click the colored square under "Color" toward the bottom of panel (Figure 11B) and select any of the colors shown (Figure 11C). Once again, FRED® auto-updates (Figure 12, shown with red selected).
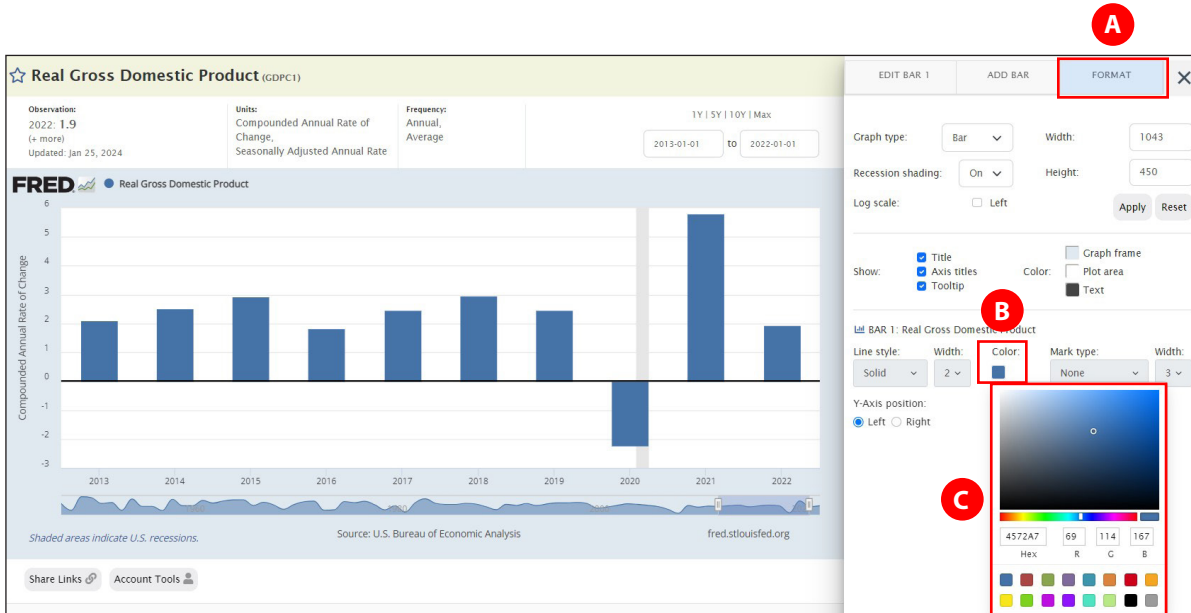

Figure 11

Figure 12

8.   **Turn Off Recession Bars**

The shaded gray area covering part of 2020 in Figure 12 indicates the most recent recession as determined by the National Bureau of Economic Research. This shading is often referred to as a recession bar, which indicates a contraction in real GDP growth. Recession bars may be turned off.

•   In the "EDIT GRAPH" panel, in the "FORMAT" tab (Figure 13A), click the "Recession bars" drop-down menu and select "Off" (Figure 13B).

•   To close the "EDIT GRAPH" panel, click the "X" at the top right (Figure 13C). The graph expands to full size.
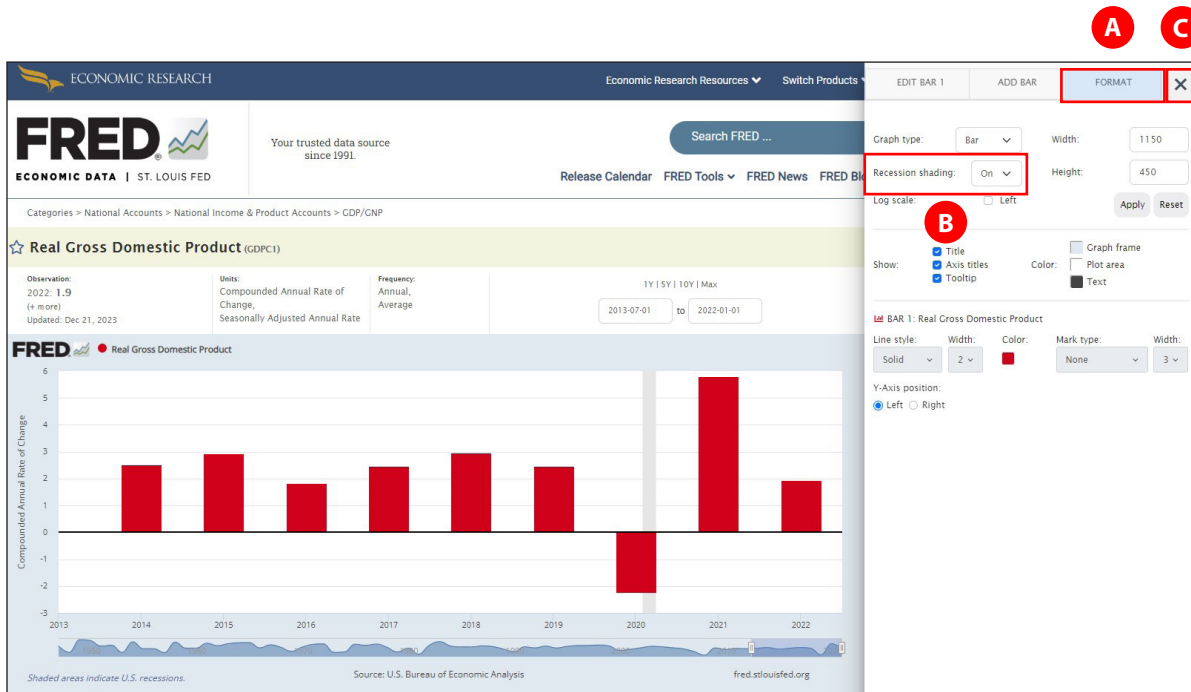

Figure 13

9.   Download a high-quality image of your custom graph.

FRED®'s attractive and informative custom graphs are perfect for reports, presentations, and web pages. Downloading the graph as an image file is easy.

- Click the blue "DOWNLOAD" button at the top right of the graph (Figure 14A).

- In the panel that pops up, select "Image (graph)" (Figure 14B). A high-quality copy of your custom graph will automatically download as a .png file.

- Locate the .png file in your downloads folder (or your usual location for downloads). Click on the file to open it in a graphics program or insert the file into a document.

Figure 14

10. Save, Share, and Permalink FRED® Graphs

Save

When you have a (free) FRED® account*, FRED® graphs can easily be saved and recalled any time from any computer or portable device, which is even simpler with the free FRED® Economic Data app downloadable from the App Store or Google Play.

- To save a graph to your desktop or laptop computer (after you have logged into FRED®), click the "Account Tools" button at the bottom left of the graph (Figure 15A).

- In the panel that pops up, click "Save Graph" (Figure 15B). A new window will open (Figure 16).

- Name your graph (Figure 16A) and select the preferred observation range (Figure 16B). You can choose whether the graph will automatically update when you open it the next time (the first two options) or be saved "as is" (the third option). NOTE: The update options only display fully when the latest value is included in the date range.

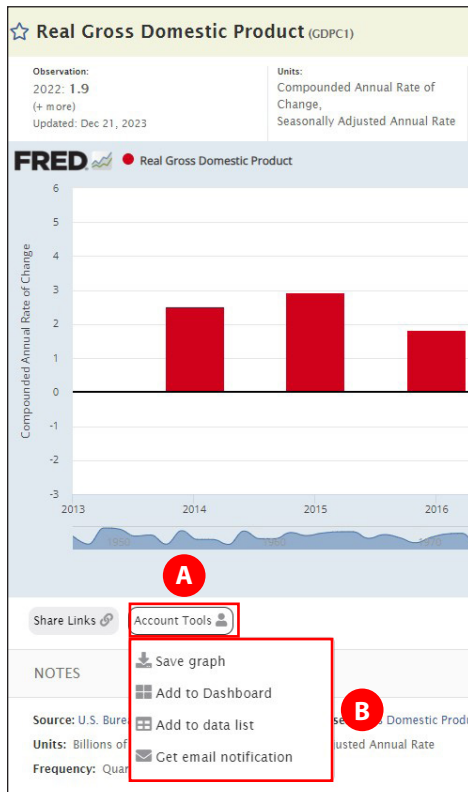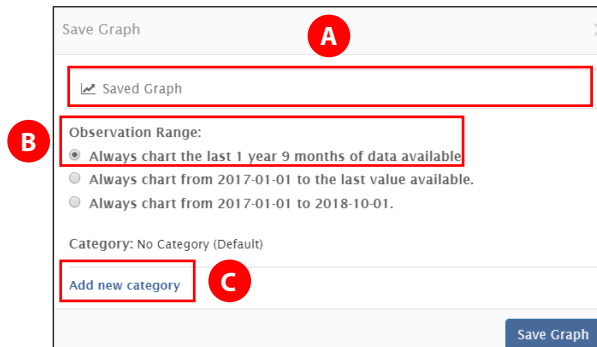- If you wish, you can also define categories by clicking "Add new Category" (Figure 16C).

Figure 16

Figure 15

*Don't have a free FRED® account? Register at https://research.stlouisfed.org/useraccount/register/step1.

Share and Permalink

FRED® offers a variety of ways to share graphs, including through email, social media, and blogs.

- To share a graph, click the "Share Links" button at the bottom left of the graph (Figure 17A) and select from the options in the panel that pops up (Figure 17B).

  The "Page short URL" option links to the FRED® website (allowing full interactivity with FRED®) and the graph you created.

  The "Embed in website" option provides an image of the graph you created that, when clicked, links to the FRED® website (allowing full interactivity with FRED®) and the graph you created. This option also provides a link for your users to download the data directly.

  The "Image short URL" option provides a link that goes to an image of the graph only.

Figure 17

Conclusion

In 10 minutes or less you have mastered 10 FRED® tools, setting you up for further FRED® success. Don't believe it? Here's a recap of the activities:

1. Find real GDP

2. Shorten the date range

3. Mouse over graph values

4. Convert to a bar graph

5. Transform frequency from quarterly to annual

6. Change units

7. Change the color

8. Turn off recession bars

9. Download a high-quality image

10. Save, share, and permalink a graph

Want to Learn More About FRED®?

For additional tutorials and FAQs, go to https://fred.stlouisfed.org/help.

To develop additional FRED® skills, see "Tools for Teaching with FRED®" (at https://www.stlouisfed.org/education/tools-for-teaching-with-fred).