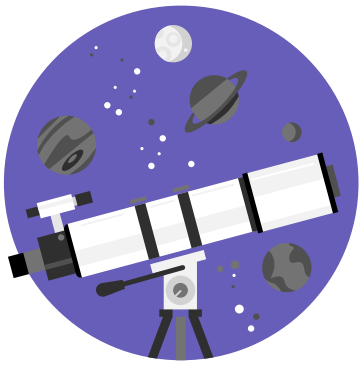
PVA TUTORIAL: CALCULATE YOUR WEIGHT ON MARS

Learn Power Virtual Agents with a Space-Themed Bot



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This activity has been created by Rishona Elijah.

Approximate time: 30 minutes

Space-themed bot series

This tutorial is part of a series of Power Virtual Agents tutorials on how to create a space-themed bot.

Prerequisite: Make sure you have completed the prerequisite here before starting this tutorial, as it builds on the same bot.

With Power Virtual Agents, you can streamline calculations. The idea of the calculator chatbot is that the bot will ask the user certain values. A standard formula will be created in Power Automate. It will take the user inputs for the calculation, and return the result back to the user.

In this tutorial, you will create a Power Automate flow in a topic to calculate a person's weight on Mars.

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What you'll need

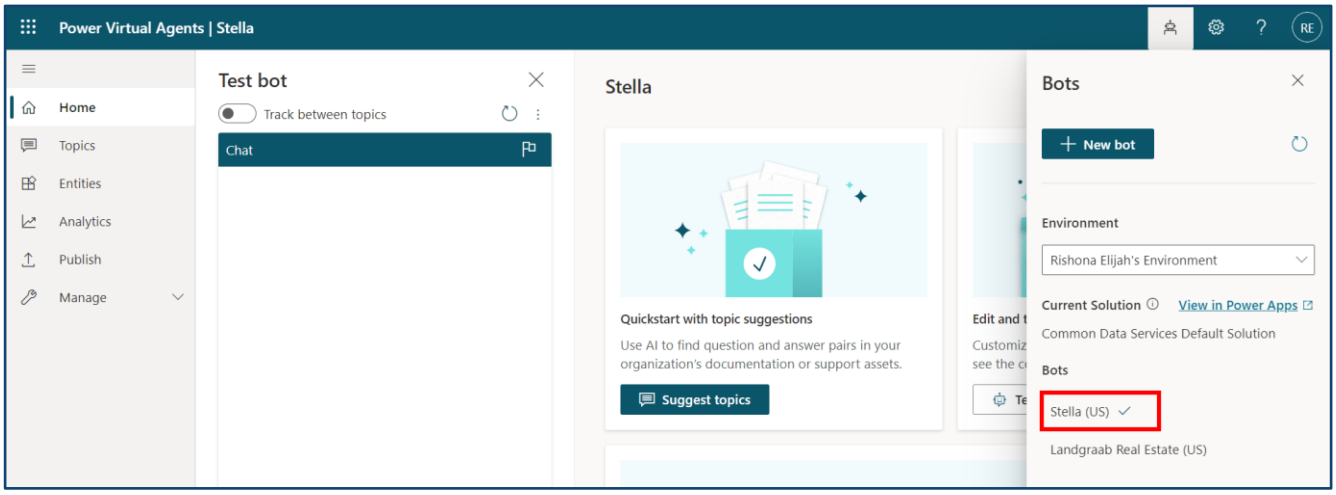
To complete the activity, you will need access to Power Virtual Agents. If you haven't already, you should sign up for a developer plan environment. With this, you should have access to a Power Virtual Agents trial.

Prerequisite: Make sure you have completed the prerequisite here before starting this tutorial, as it builds on the same bot.

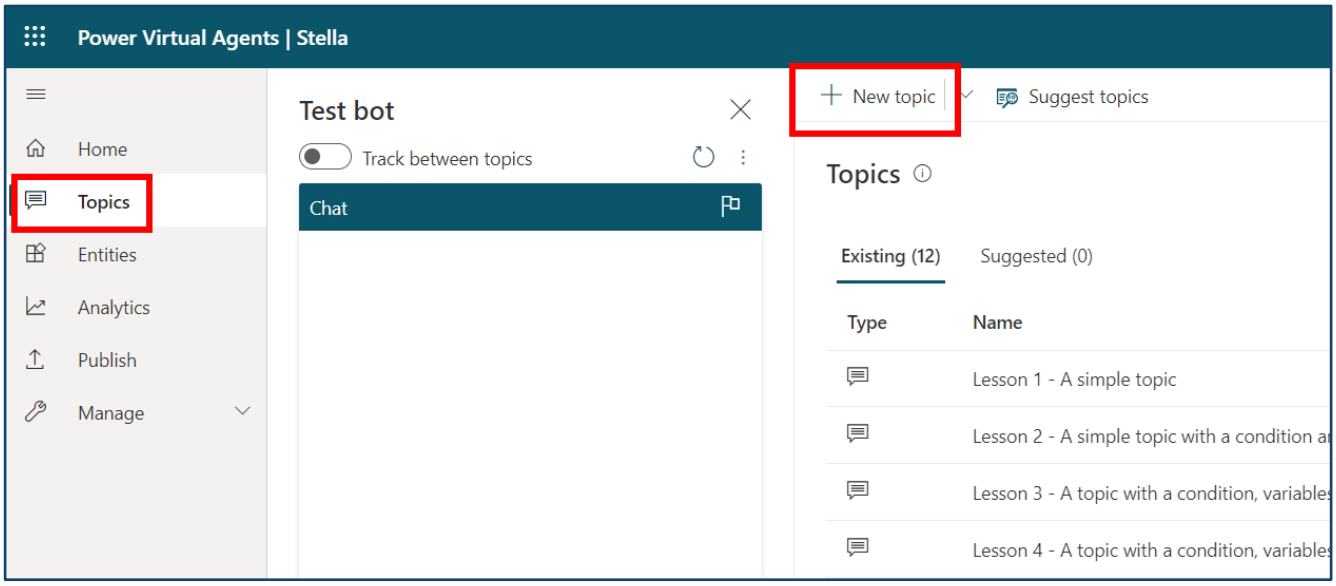
1. Create a new topic

You will start by creating a new topic for your space-themed bot, to calculate weight on Mars (Martian weight).

1. In your browser, go to https://web.powerva.microsoft.com/ and sign in with your work (Microsoft, Office 365) credentials. Open the space-themed bot you have been building.

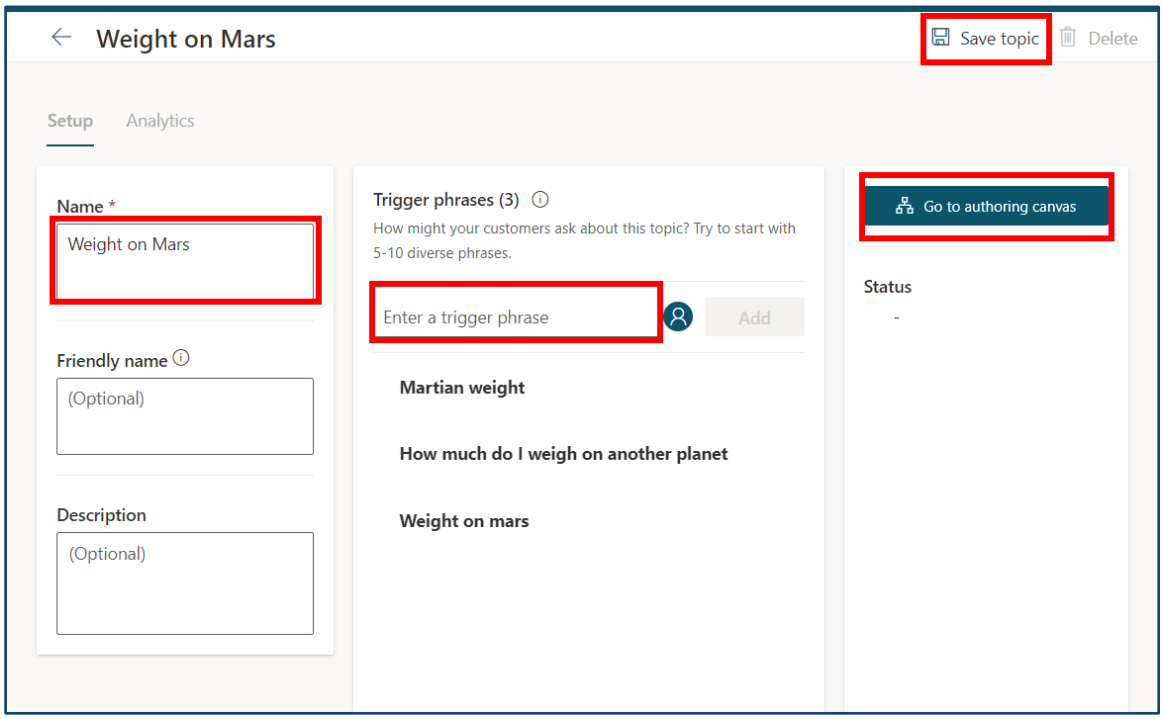


2. In Power Virtual Agents, go to **Topics** and click **+New topic**.

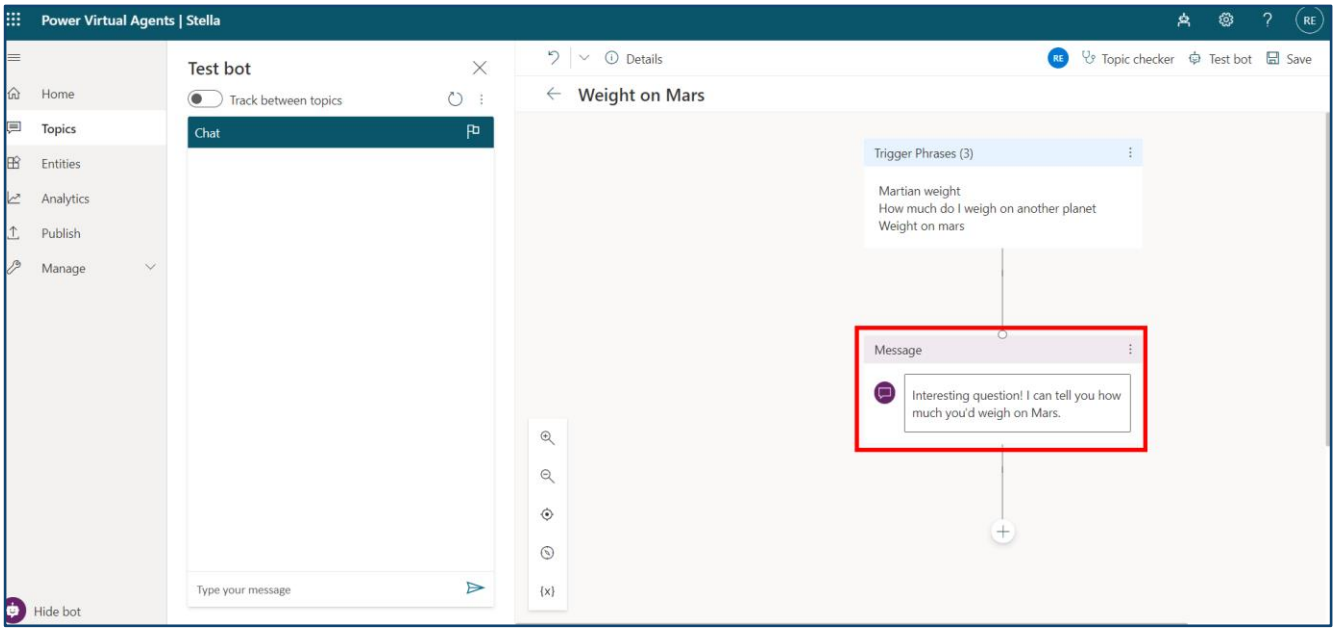


3. Enter the topic Name as **Weight on Mars** and add the following 3 trigger phrases
   Weight on mars
   How much do I weigh on another planet
   Martian weight

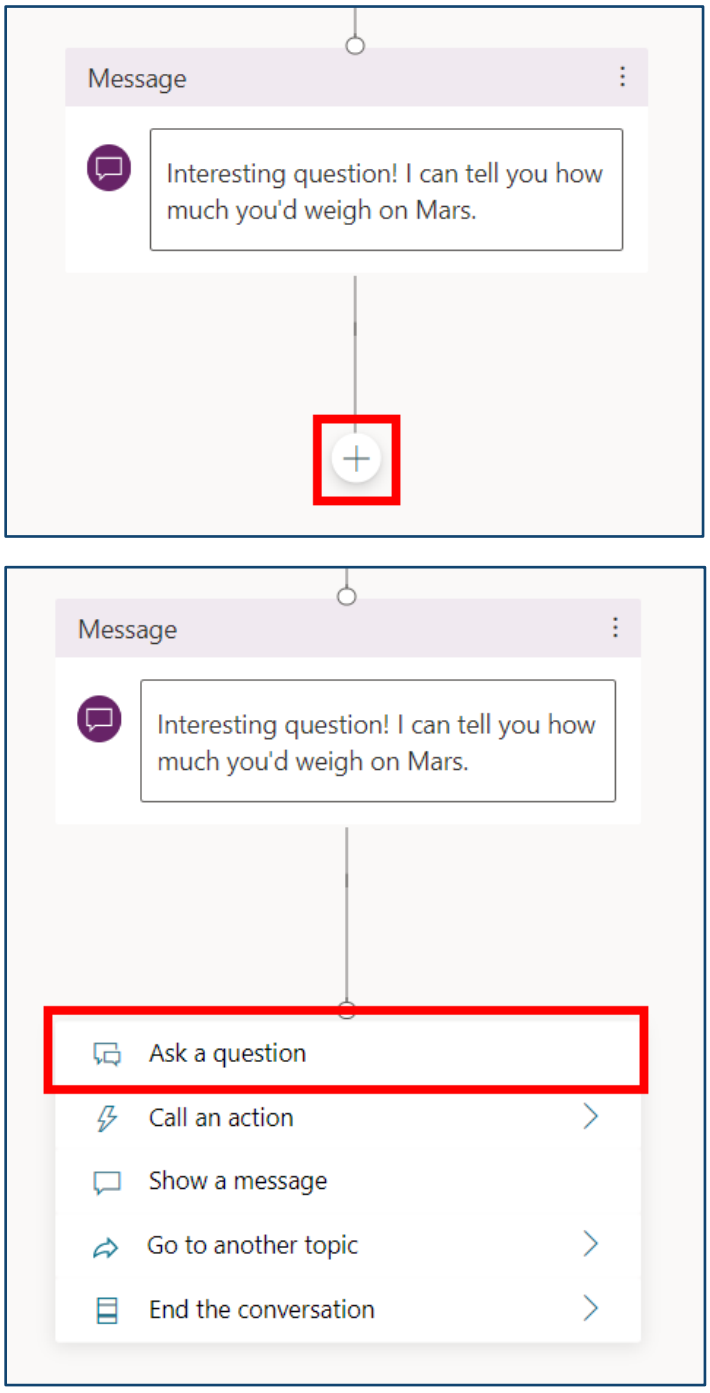
   Save the topic then click **Go to authoring canvas**.



4. In the first message node that appears, enter the following text.
   Interesting question! I can tell you how much you'd weigh on Mars.

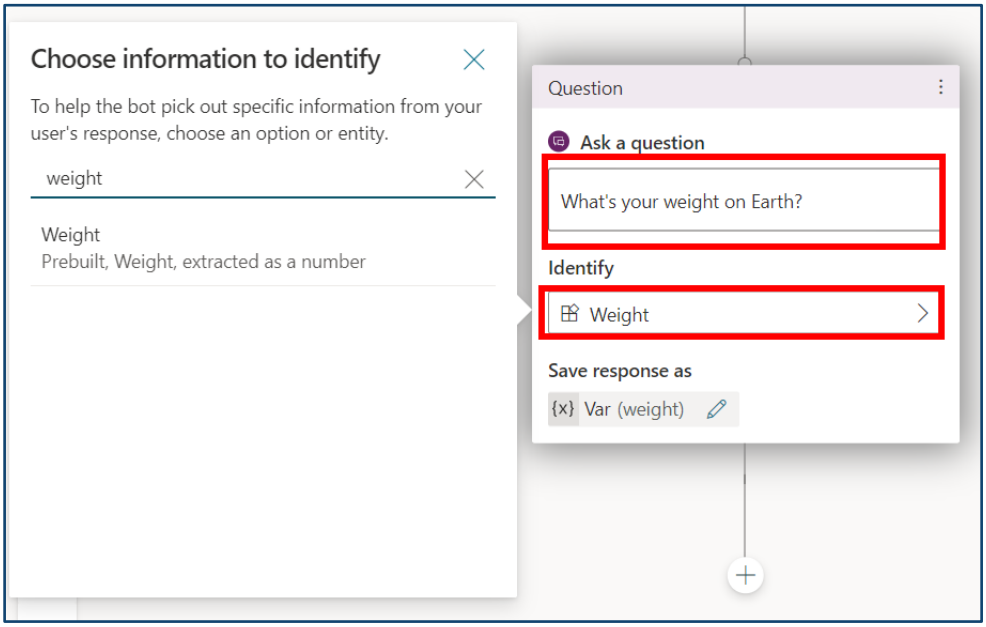


5. Add a new node by clicking the **+** icon underneath the last message node. You will add a question node here. Click **Ask a question**.



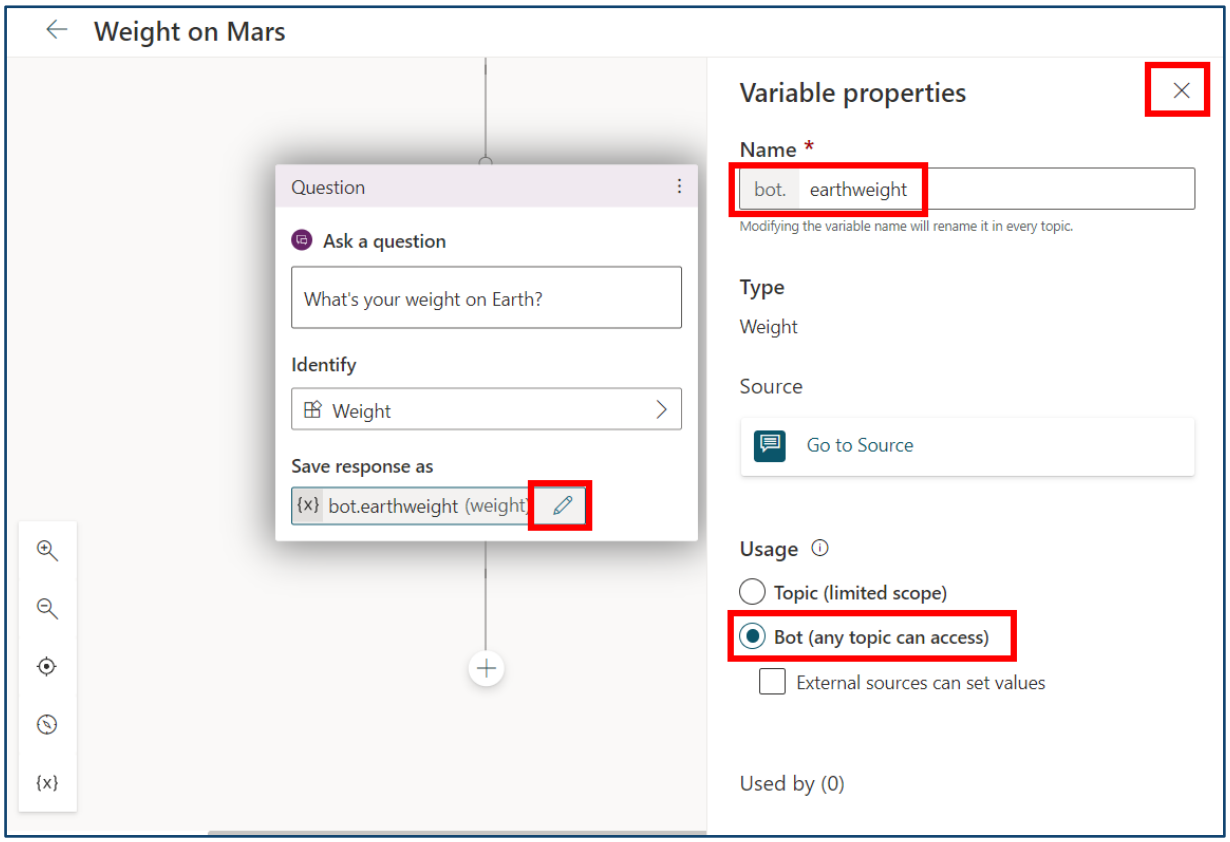
6. In the question node, enter the following question
   What's your weight on Earth?

   In the Identify field, search for and select **Weight**.



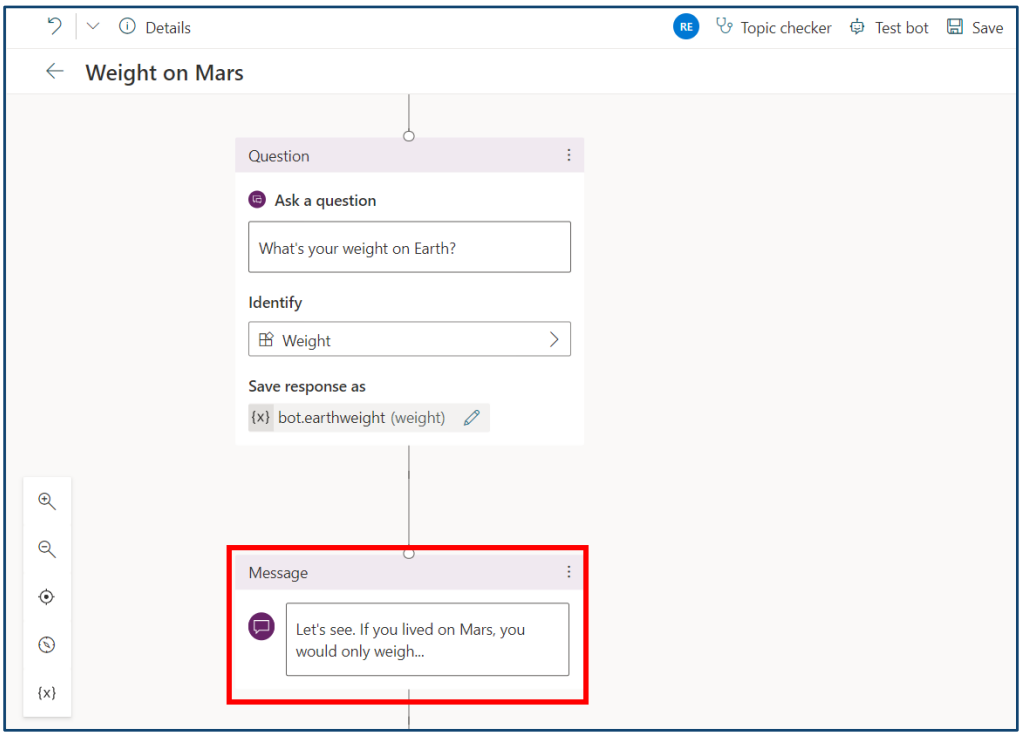
At this stage of the conversation, the bot will expect the user to enter their weight, and this setting will allow the bot to identity it. It will be stored as a variable, which can be used in Power Automate flows and elsewhere across the bot.

7. Click the pen icon in the Save response as area. Rename the variable to **earthweight** so that we can easily identify it. Select **Bot** as the usage, then close the pop-out window.
   The usage is set to Bot so that if you were to create another topic needed the person's weight, the question does not need to be asked again.

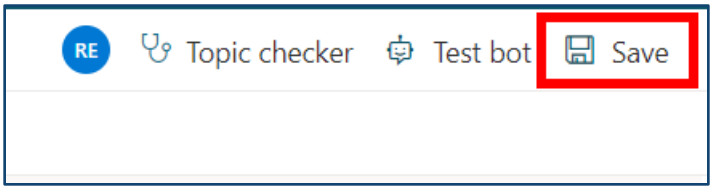


8. Add a new message node by clicking the **+** icon undeath the question node and selecting **Show a message**. Enter the following text into the node.

   Let's see. If you lived on Mars, you would only weigh...



9. Click **Save** in the top right corner.



2. Create a Power Automate flow to generate and return the Martian weight

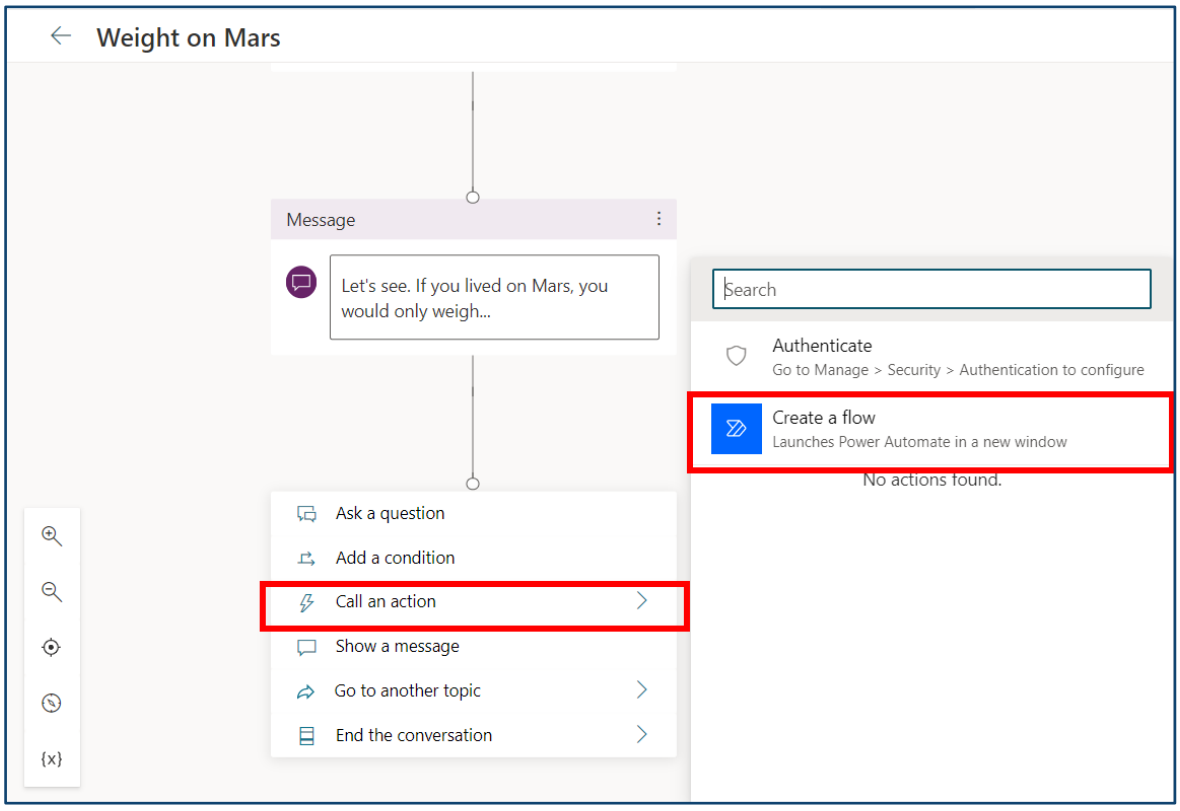
You will now create a flow to calculate the Martian weight based on the weight input the user provided in the conversation. Weight on Mars is calculated by the formula:

$$\text{Weight on Mars} = \text{Weight on Earth} \div 9.81 \times 3.711$$

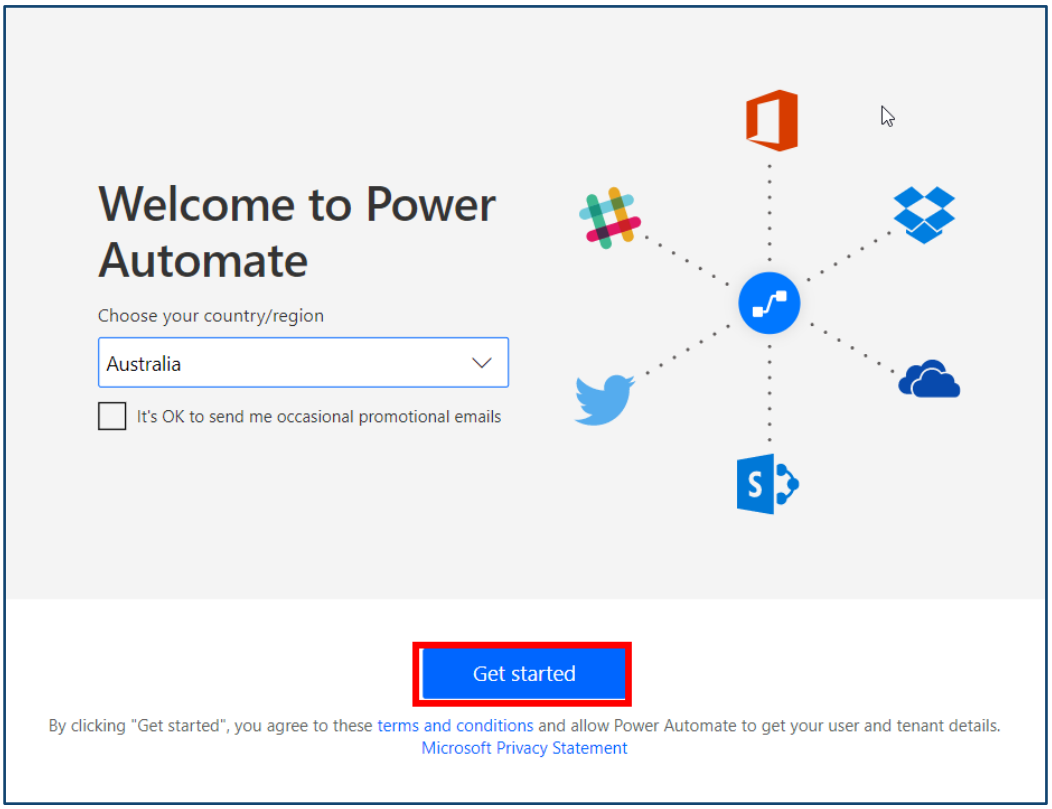
Background:

- Weight on earth is divided by $9.81 m/s^2$, which is earth's force of gravity. This part of the formula calculates the mass of the person.
- $3.711 m/s^2$ is the gravitational force of Mars. This, multiplied by the person's mass will give us their weight on Mars.
- The unit of weight does not matter. The user can provide weight in kilograms, pounds, or any other way.

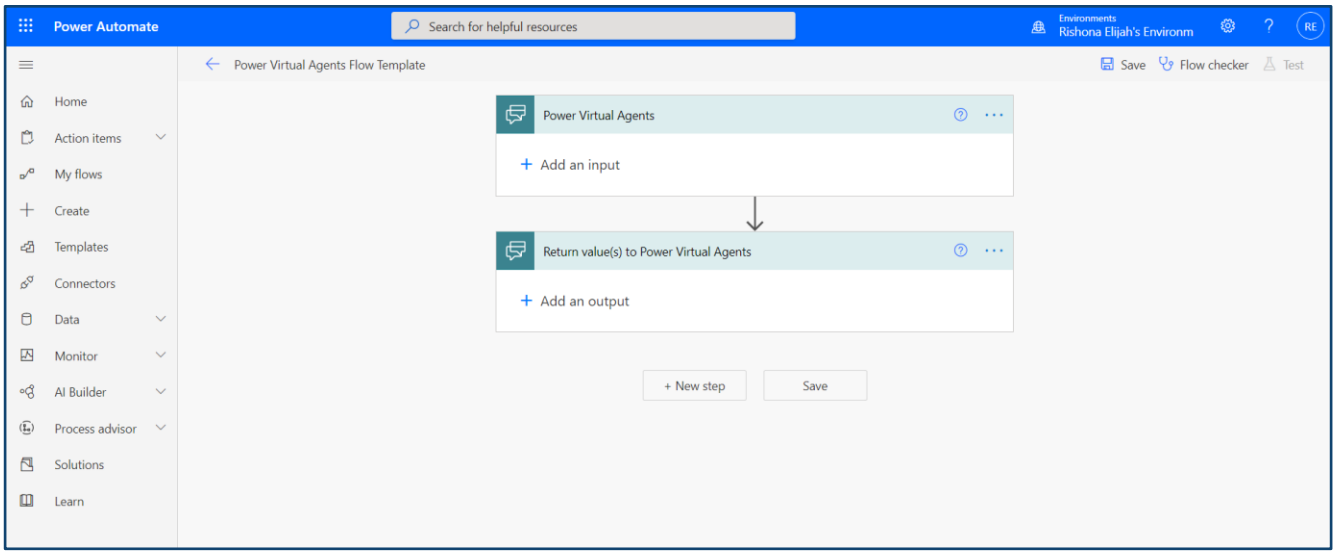
1. In your Weight on Mars topic, add a new node underneath the last message. Select **Call an action** > **Create a flow**.



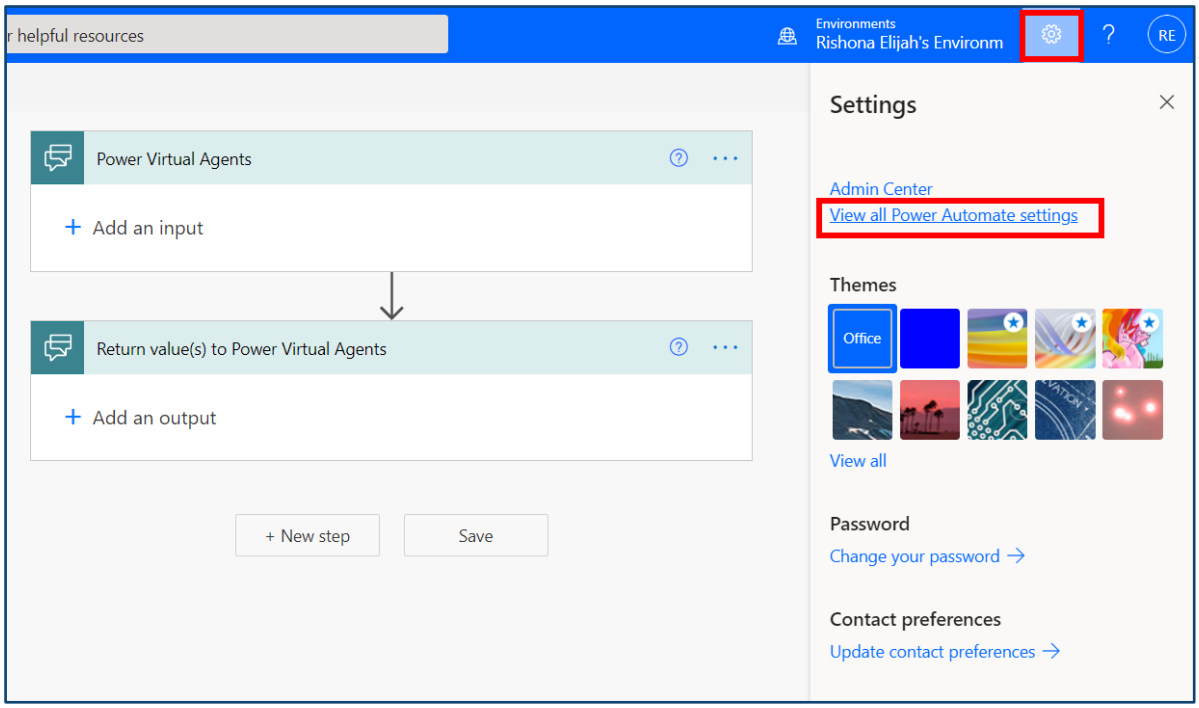
2. Power Automate will open in a new tab. If prompted, click **Get started**.



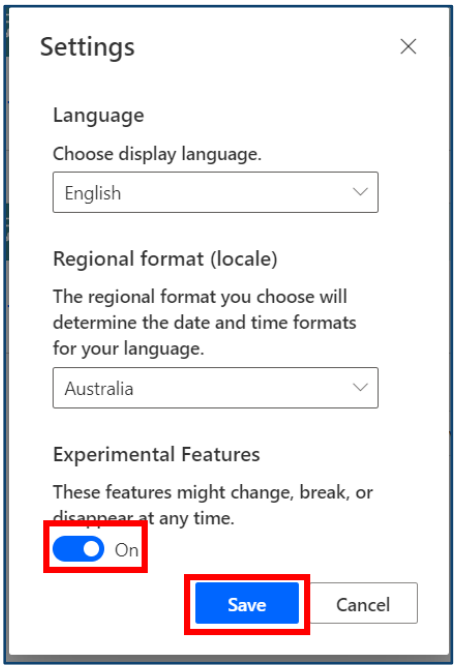
If you clicked Get started, you likely have not been automatically taken to the right template. Close the Power Automate tab, and repeat step 1 again to launch Power Automate in a new tab. Your screen should appear as shown below.



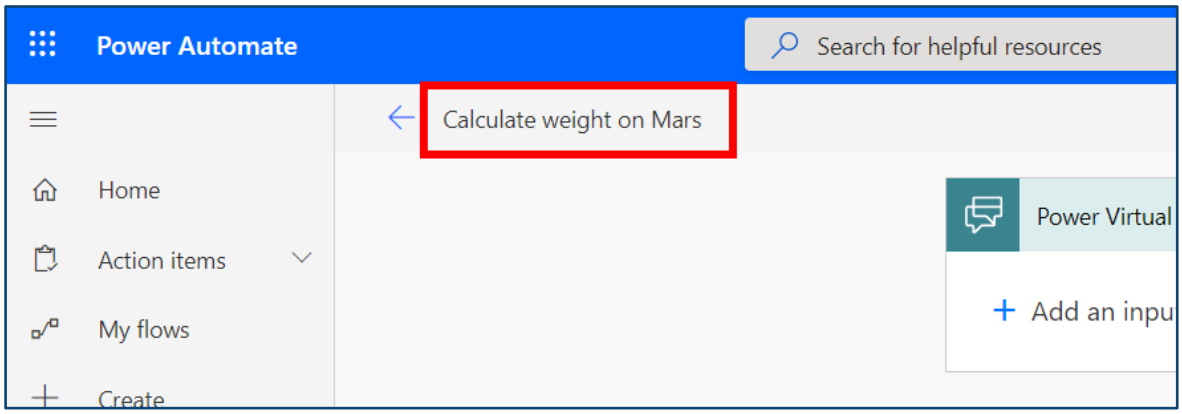
3. We will change a setting in Power Automate to make writing expressions easier. Click the **Settings** icon in the top right of the screen, then click **View all Power Automate settings**.



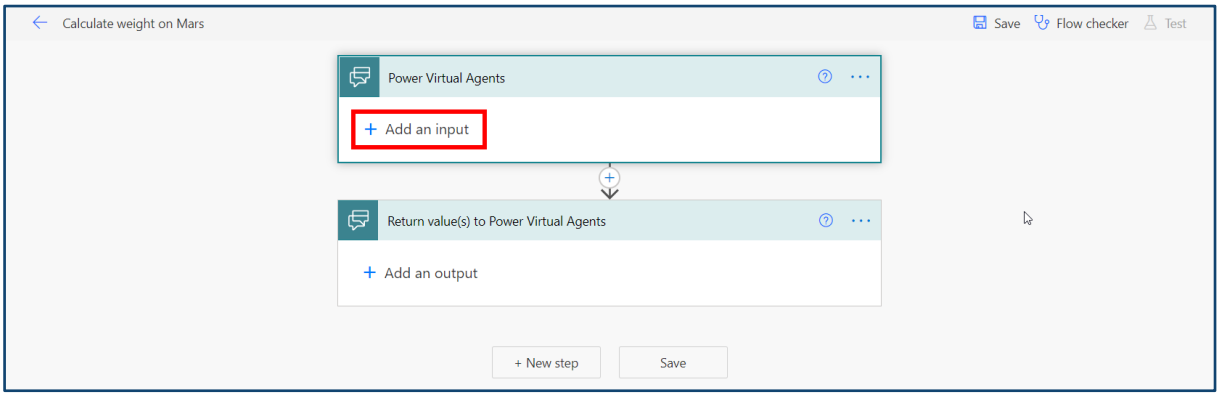
4. Switch the Experimental Features toggle to **ON** and click **Save**.



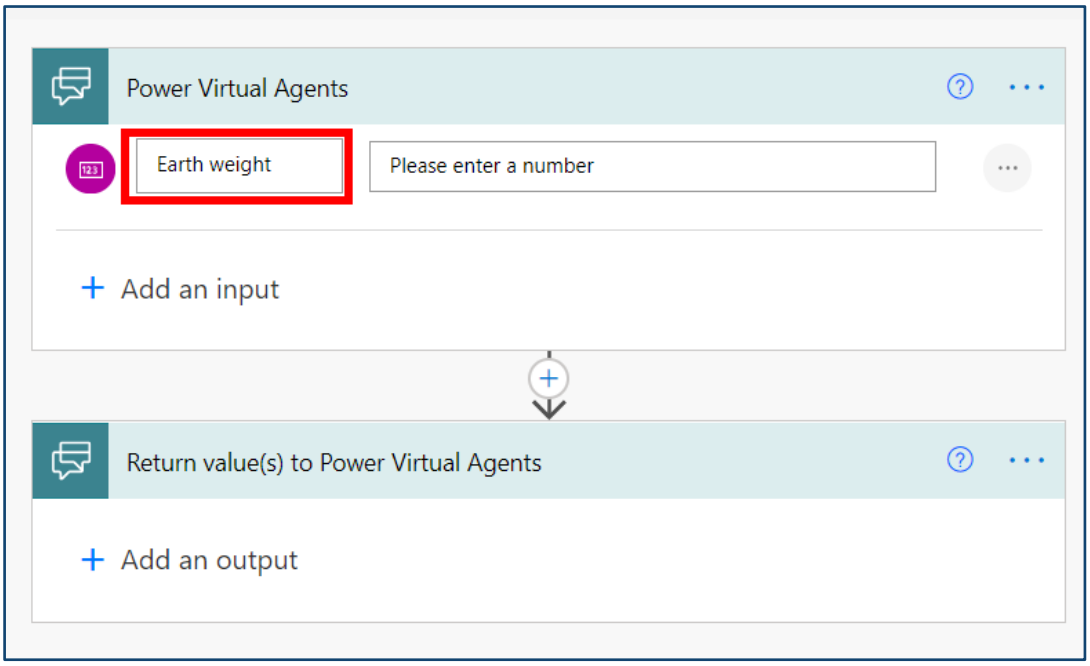
5. Rename the flow by click on the flow name as shown below. Rename the flow to **Calculate weight on Mars**.



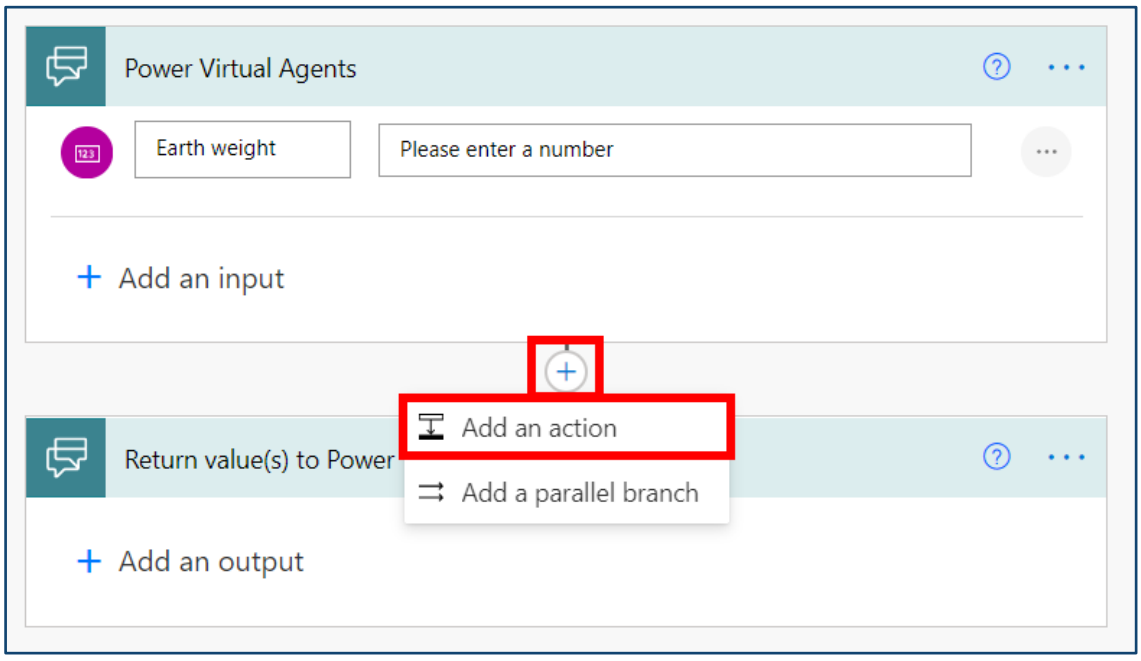
6. Within the Power Virtual Agents trigger of the flow, click on **+Add an input** and select **Number**.



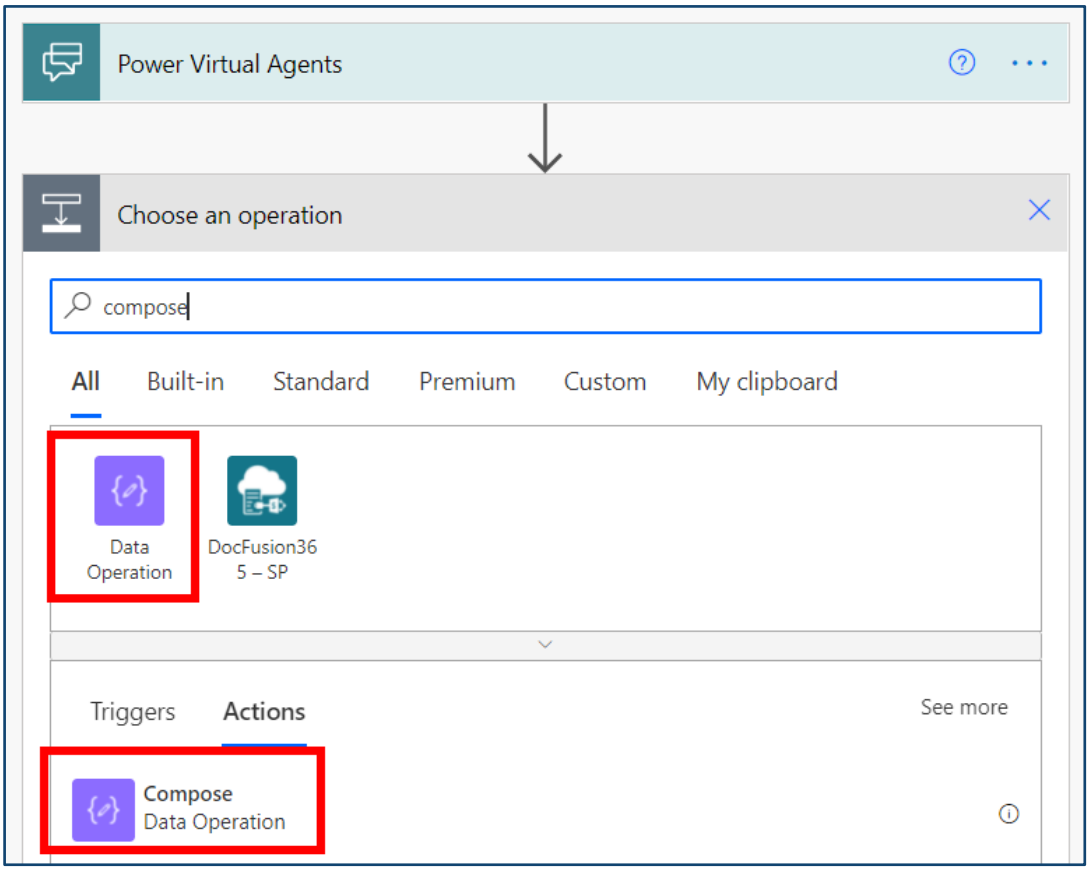
7. Rename the input to **Earth weight** as shown below. This input will be our reference to the weight the user has provided throughout the conversation.



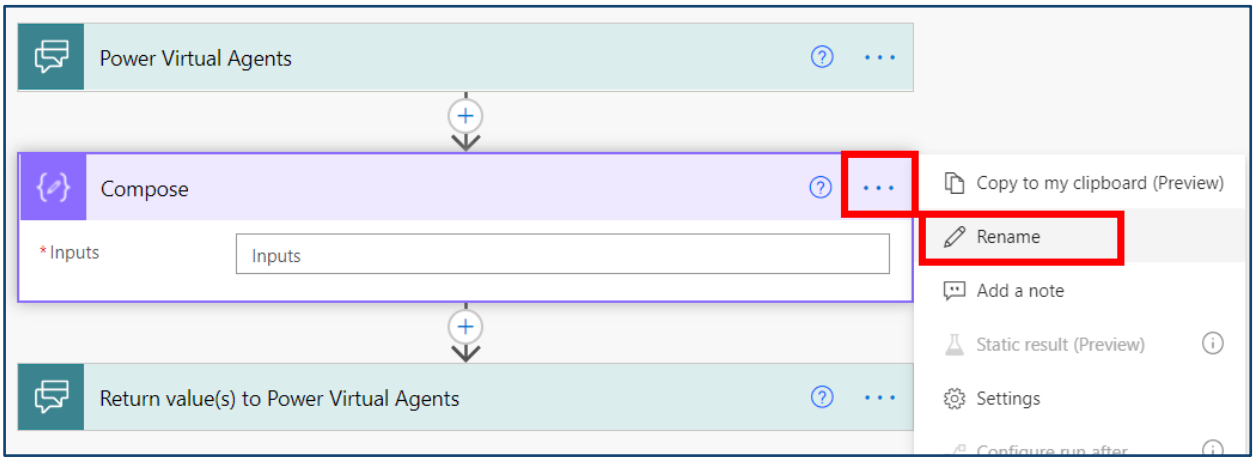
8. Add an action underneath the trigger.



9. Search for and select the Data Operation action **Compose**.

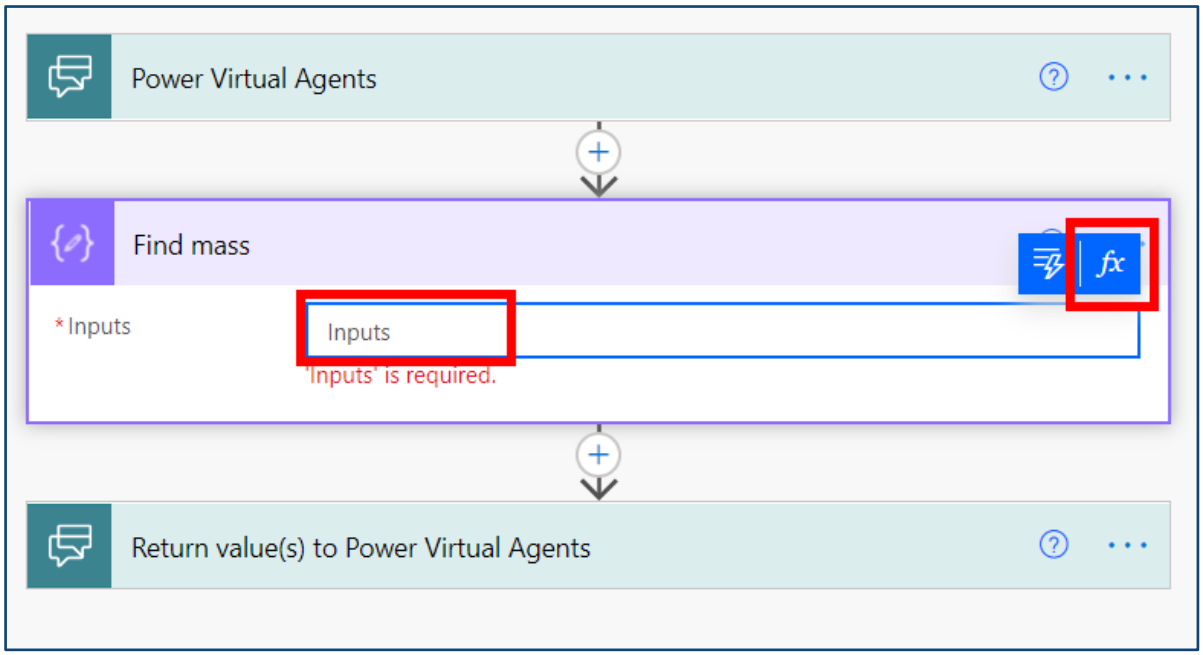


10. Click on **...** on the Compose action to rename it. This is so we can easily which part of the formula this action will handle.



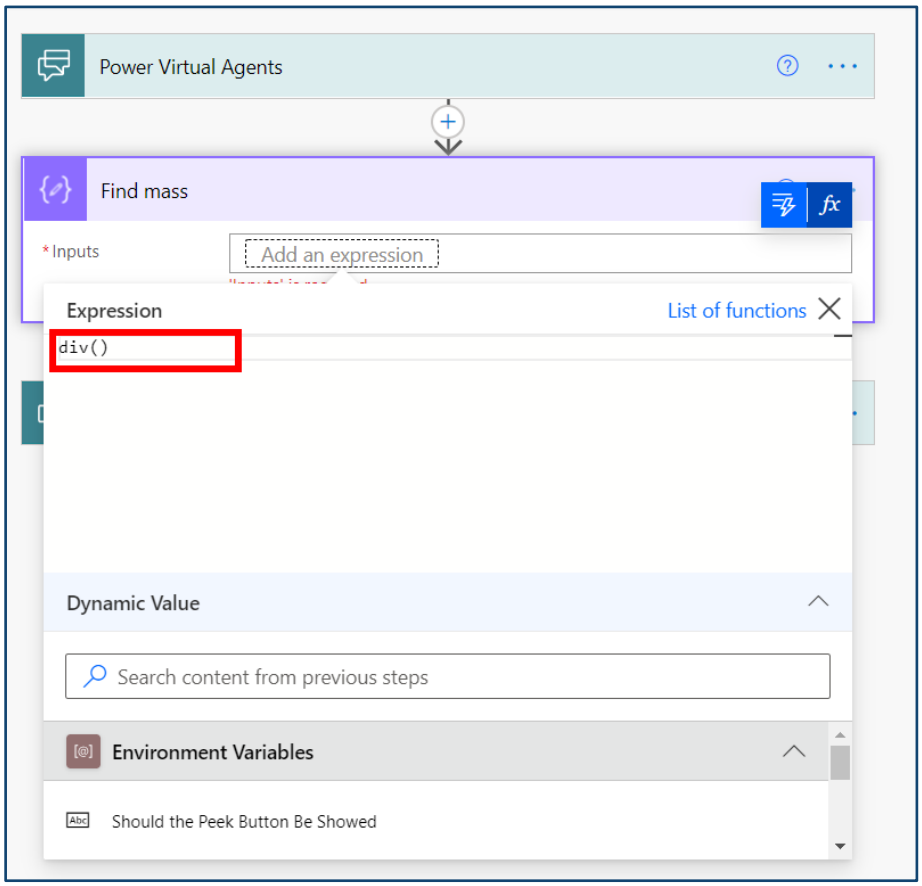
11. Rename the compose action to **Find mass**.

12. Click into the Inputs field, and click the **fx** button that appears. Here, we will enter in an expression for the first part of the formula.



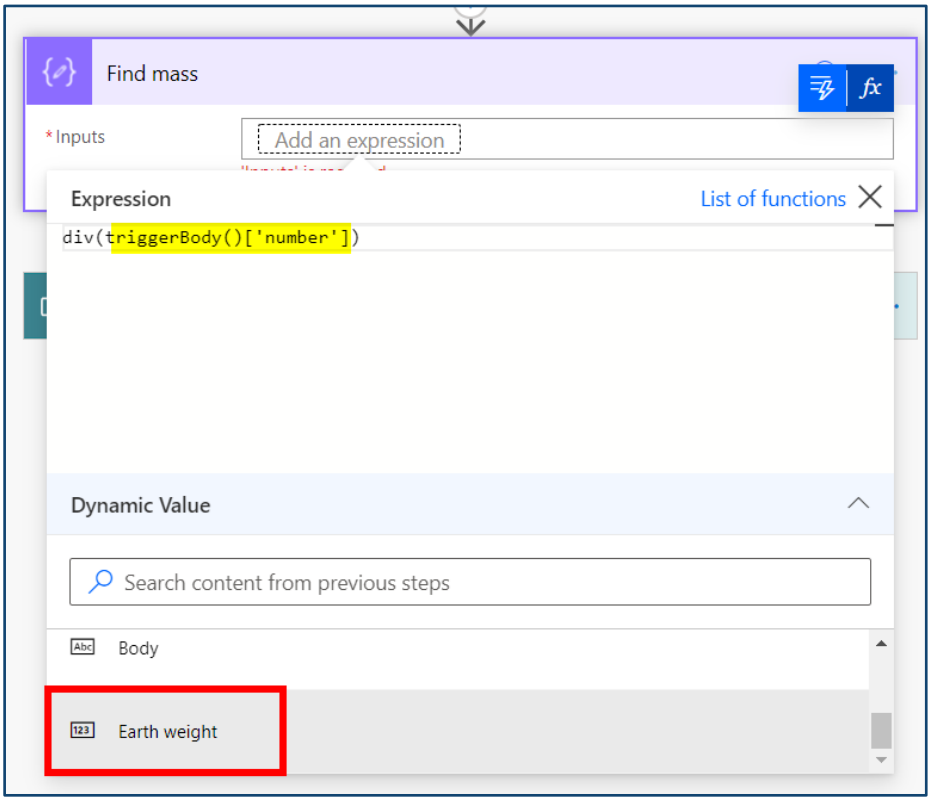
13. In the expression area, start typing in the expression
    div(

) will be automatically added to the end of it.



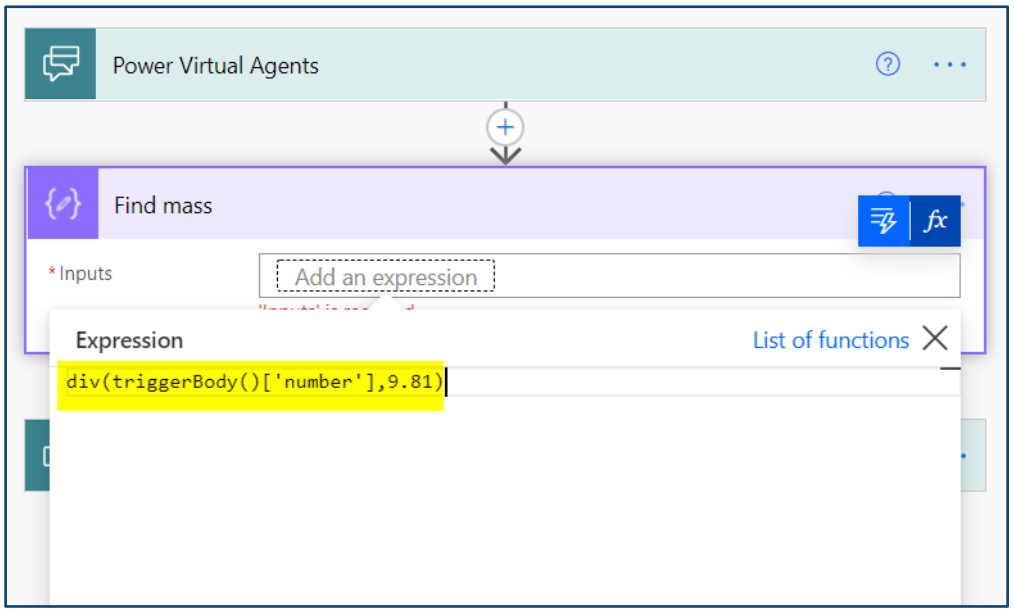
Place your cursor directly after the (symbol

From the Dynamic Value area, scroll until you see the input Earth weight and select it. This will add the highlighted text into your expression.

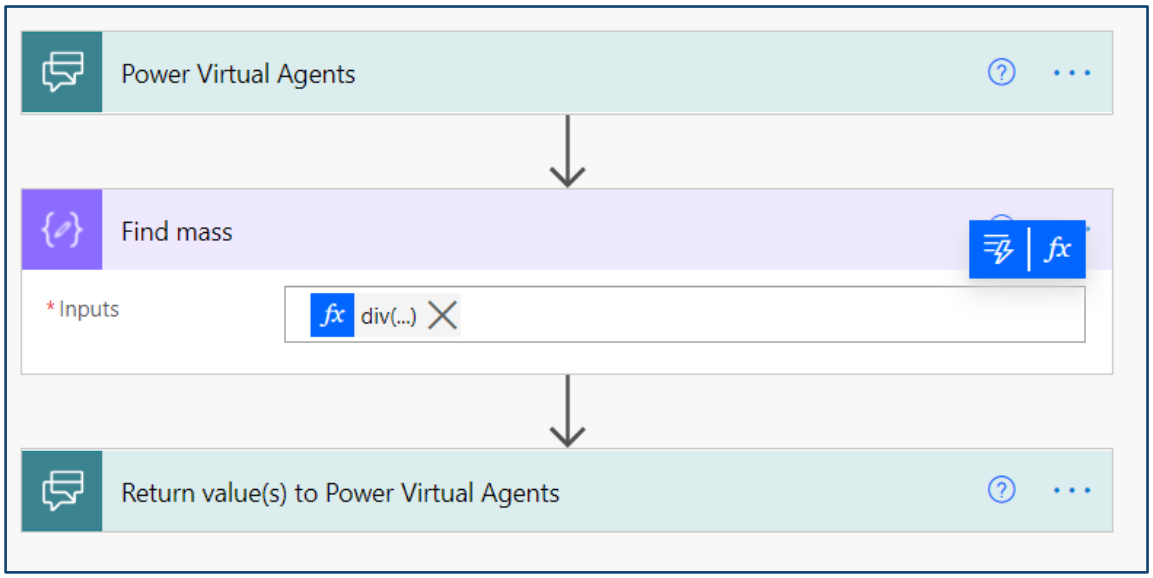


After the] symbol in the expression, type:
,9.81

Your expression should now appear as shown below.



To save the expression, click in any whitespace of the flow, outside of the Expression pop-out.

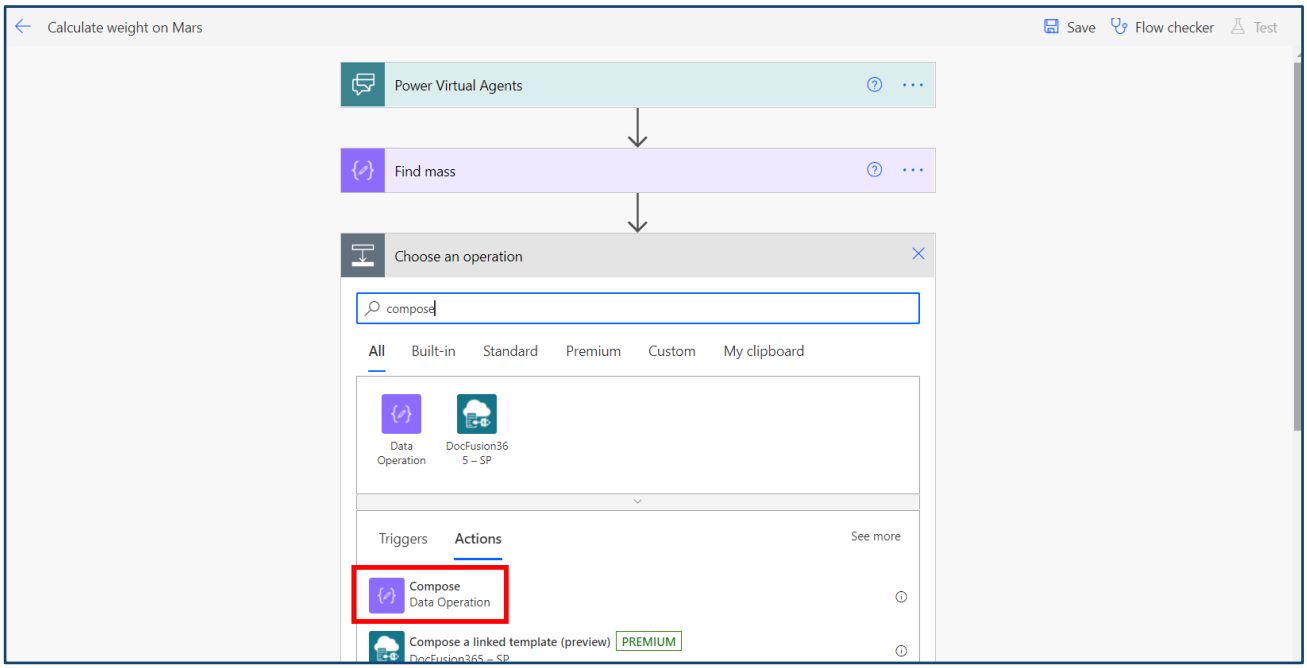


Expression explained

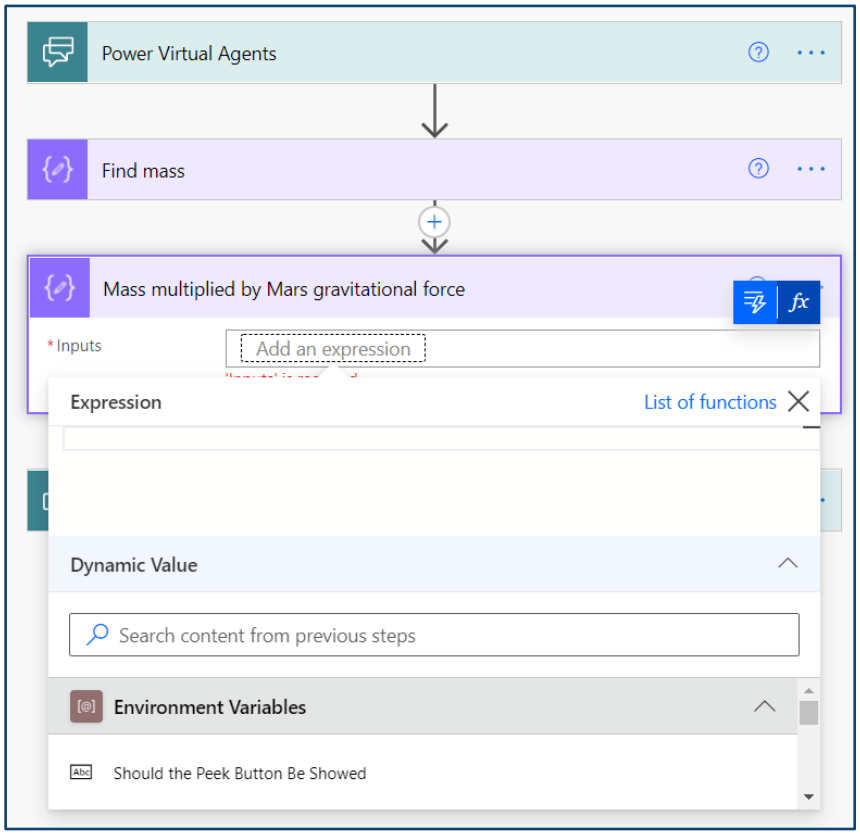
This is a breakdown of the expression you have just used. It represents the first part of the formula, Weight on Earth ÷ 9.81

1. div() = Divide values
2. triggerBody()['number'] = This references the weight on Earth input given by the user
3. , 9.81 = the number you want to divide by

14. Under your Find mass action, add another Data Operation- Compose action. Rename the action to **Mass multiplied by Mars gravitational force**.

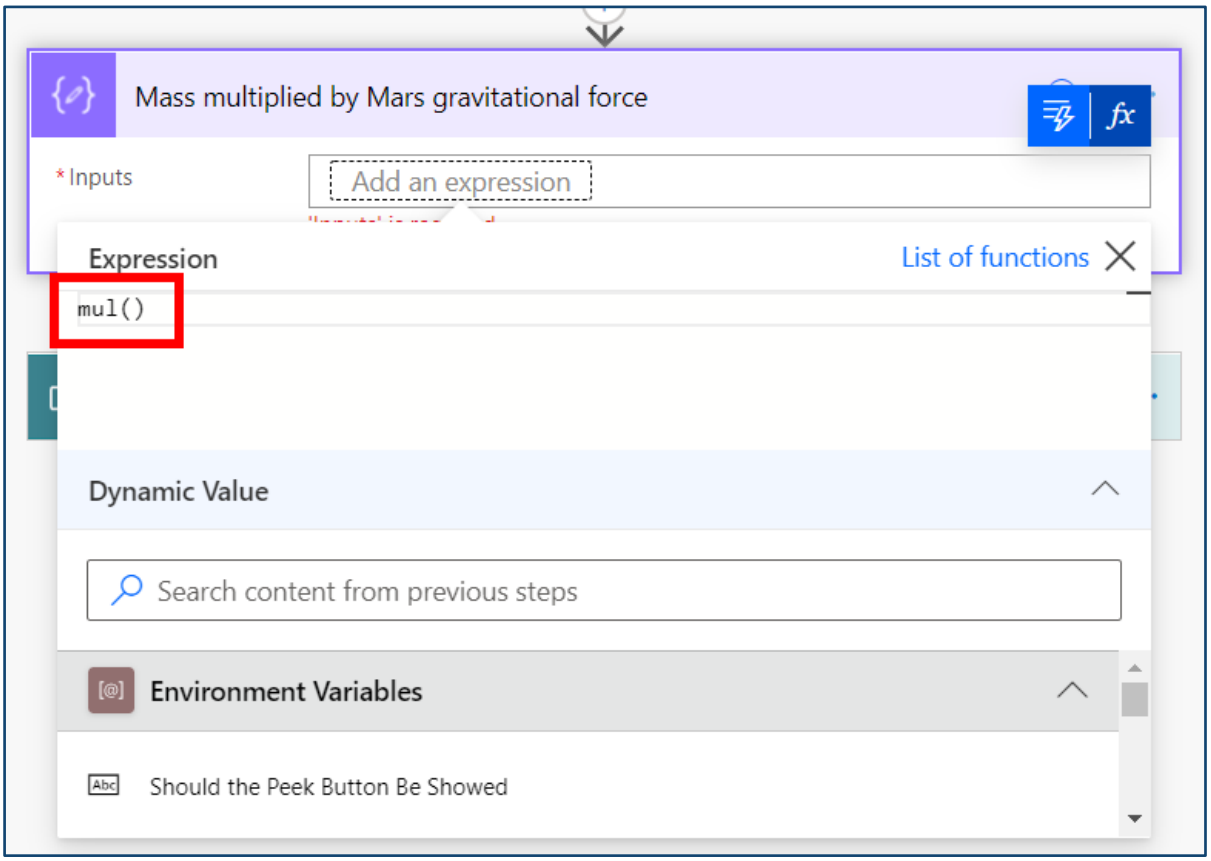


15. Another expression will be used here to represent the last part of weight on mars formula. Click into the Inputs field and click the **fx** button.



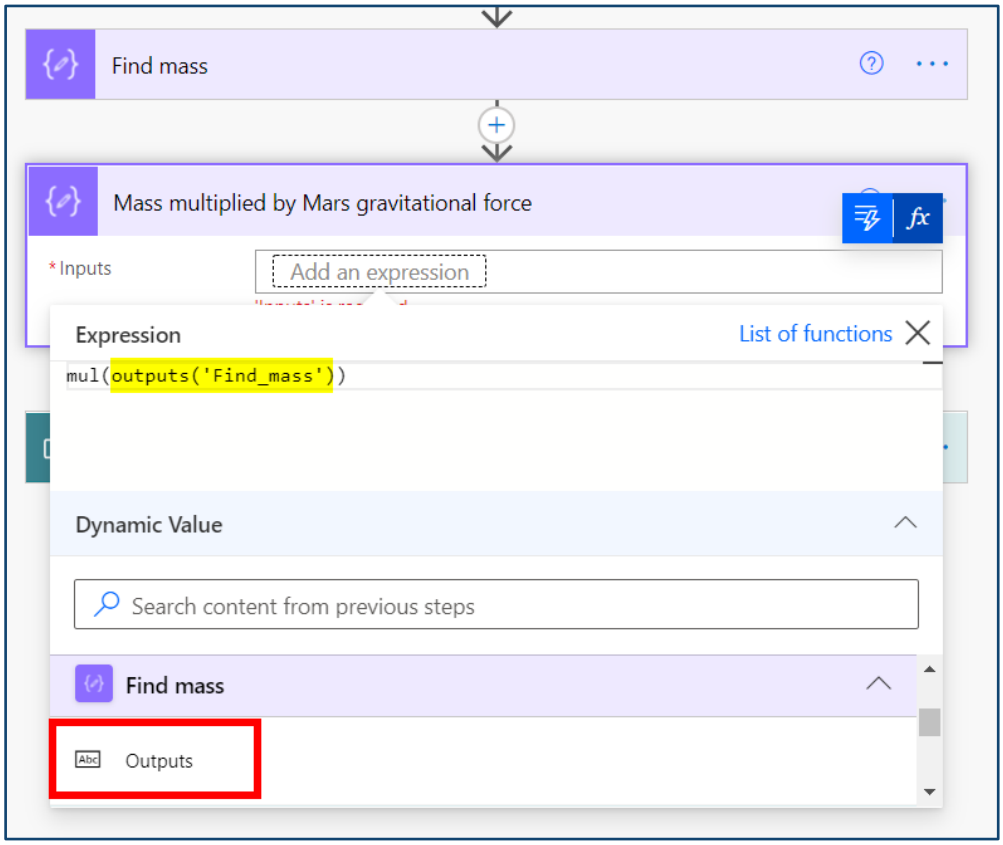
16. In the expression area, start typing in the expression
    mul(

) will be automatically added to the end of it.



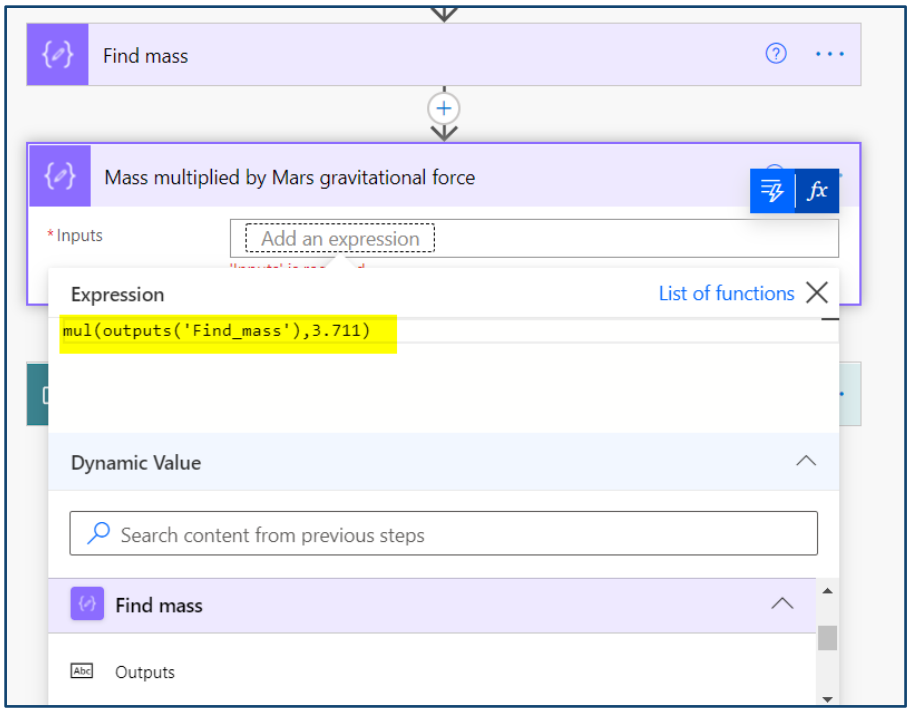
Place your cursor directly after the (symbol

From the Dynamic Value area, scroll until you see **Outputs** from the Find mass action and select it. This will add the highlighted text into your expression.



After the ') symbols in the expression, type:
,3.711

Your expression should now appear as shown below.



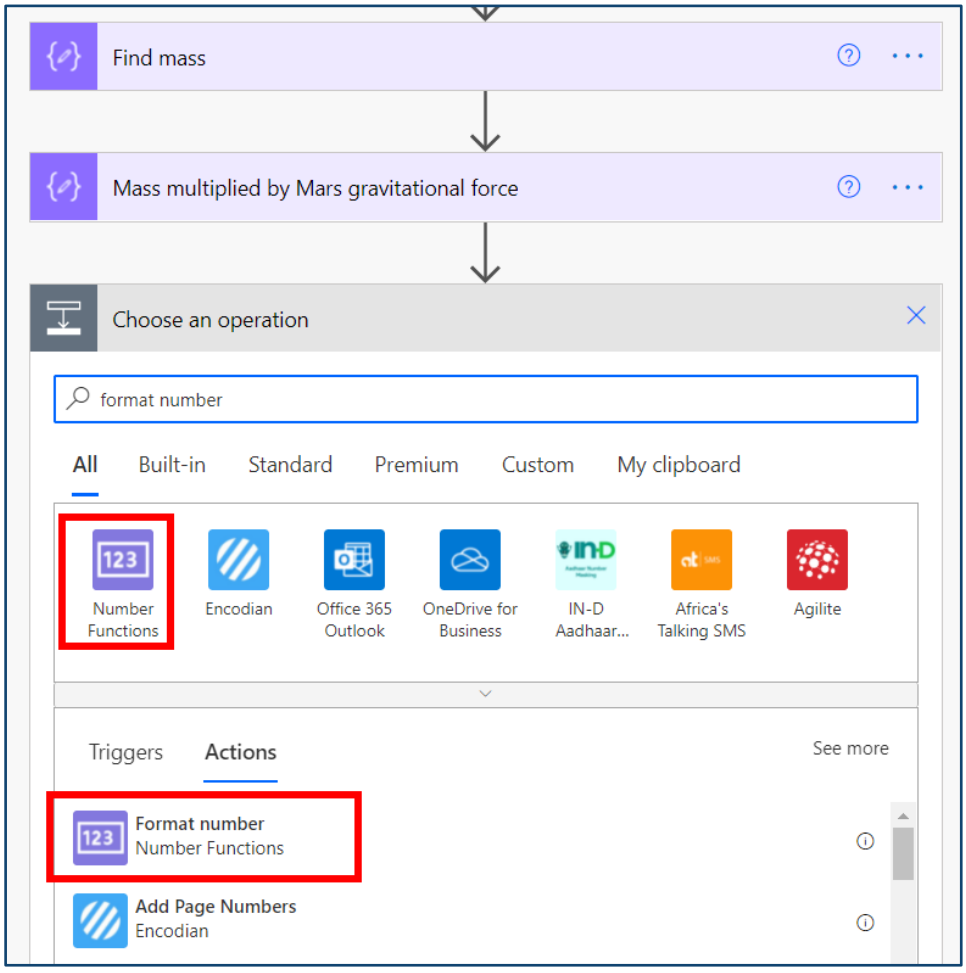
To save the expression, click in any whitespace of the flow, outside of the Expression pop-out.

Expression explained

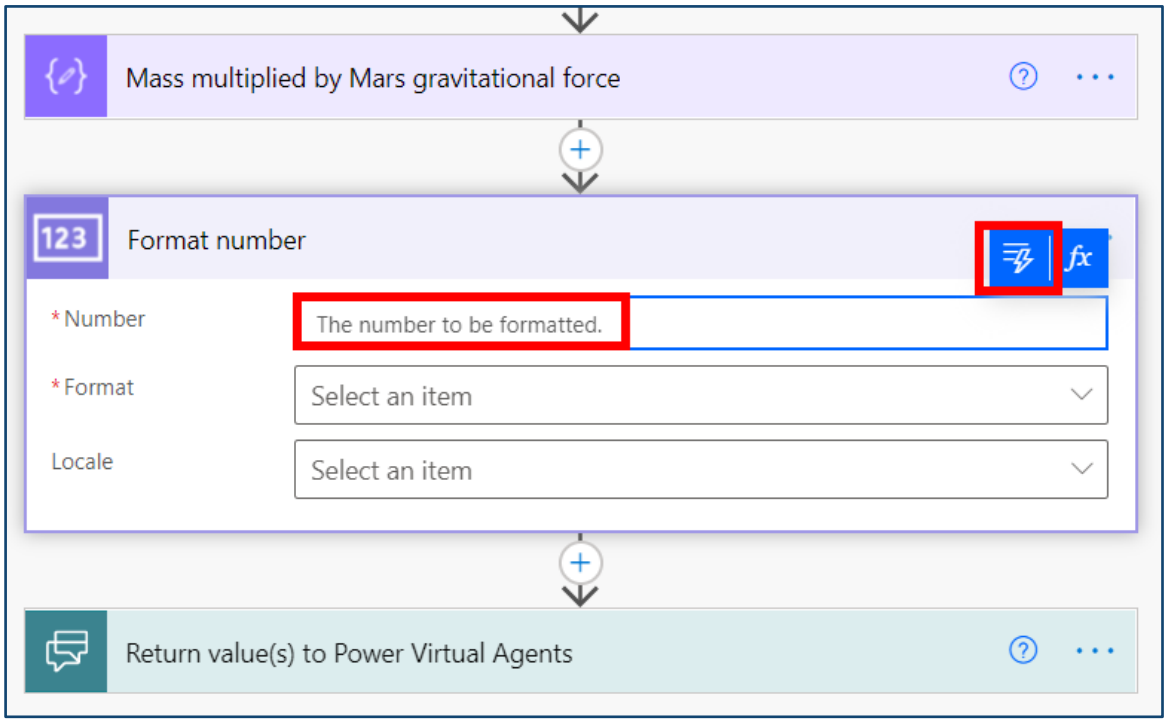
This is a breakdown of the expression you have just used. It represents the last part of the formula, Mass × 3.711

1. mul() = multiply values
2. outputs('Find_mass') = This references the result of the previous step where mass was calculated.
3. 3.711 = the number you want to multiply by

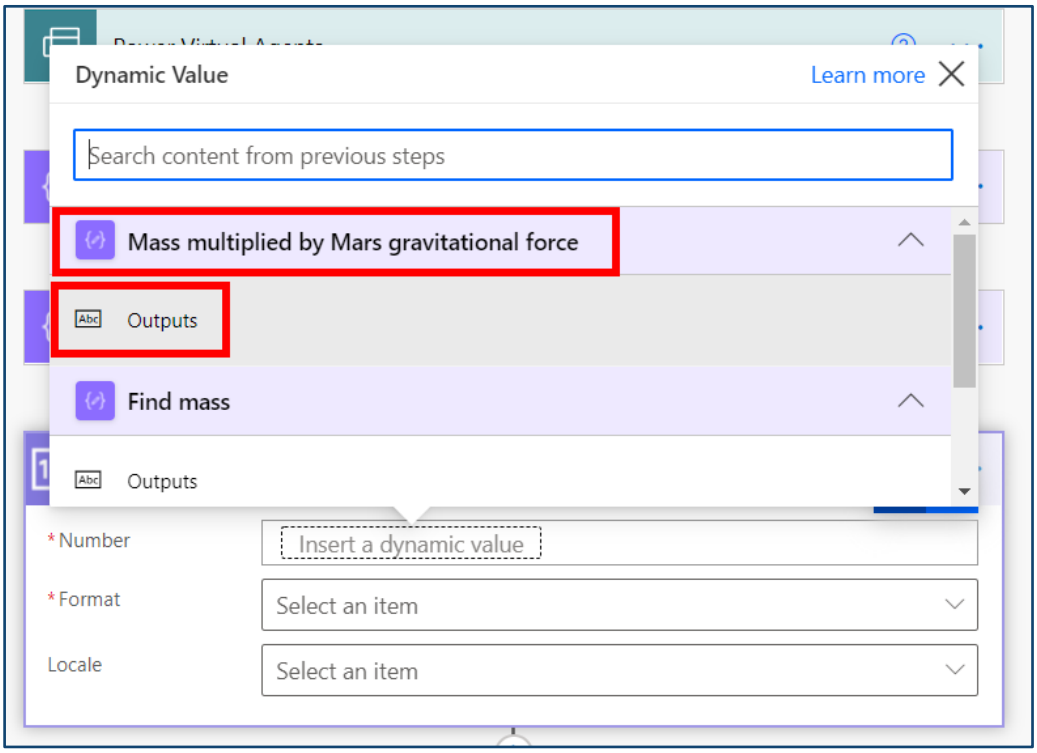
17. The formula part of the flow is now complete. However, it is likely the result will have many decimal places, which does not appear user friendly. You will add a step to round the calculated weight on Mars to two decimal places. Under the last Compose action, add a new action for Number Functions- **Format number.**



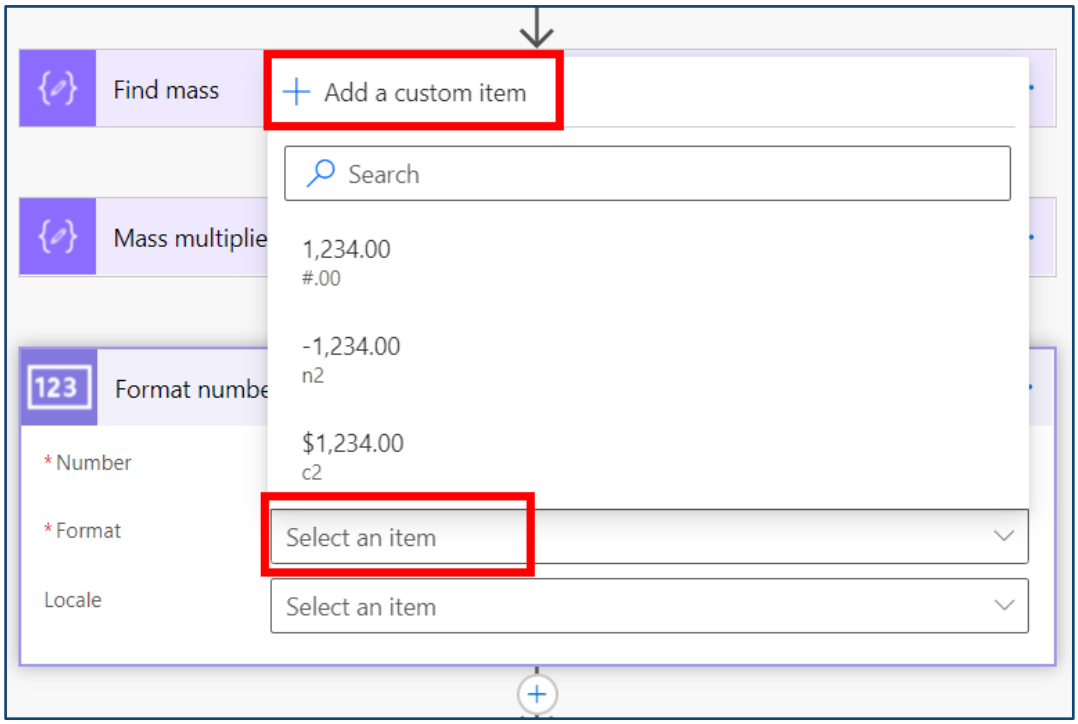
18. Click into the Number field and click the **Add dynamic value** button.



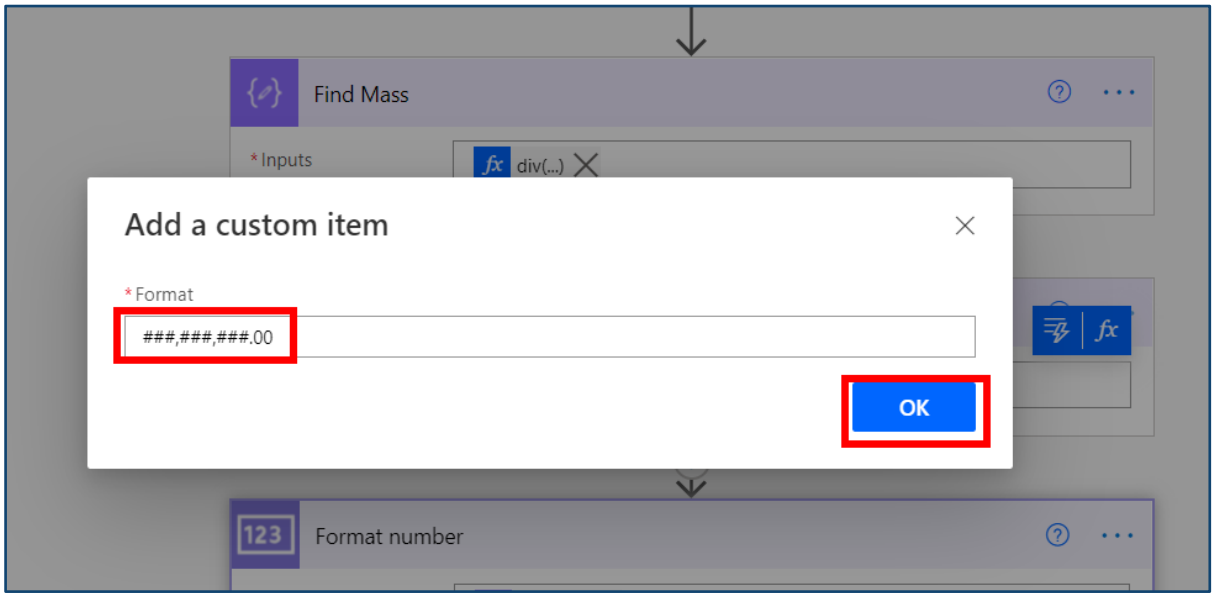
19. From the list of dynamic content, select **Outputs** from the **Mass multiplied by Mars gravitational force**. Do not confuse it with the Outputs dynamic content of the Find mass action.



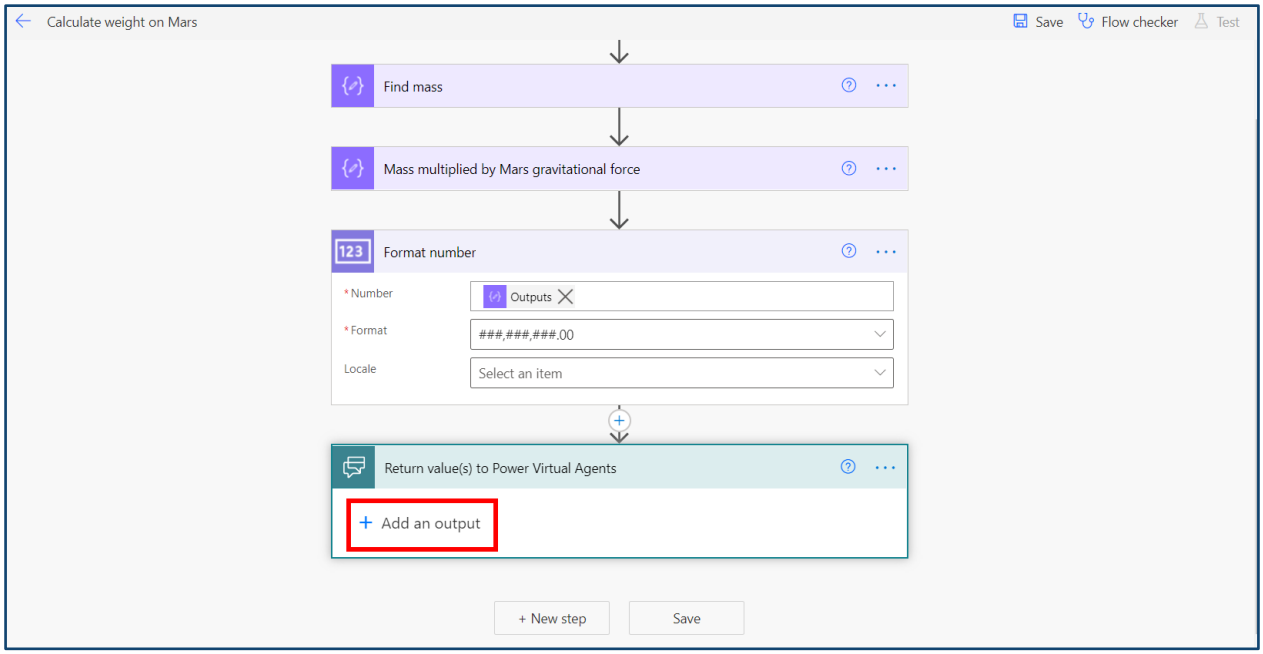
20. For the Format field, select **+Add a custom item**.



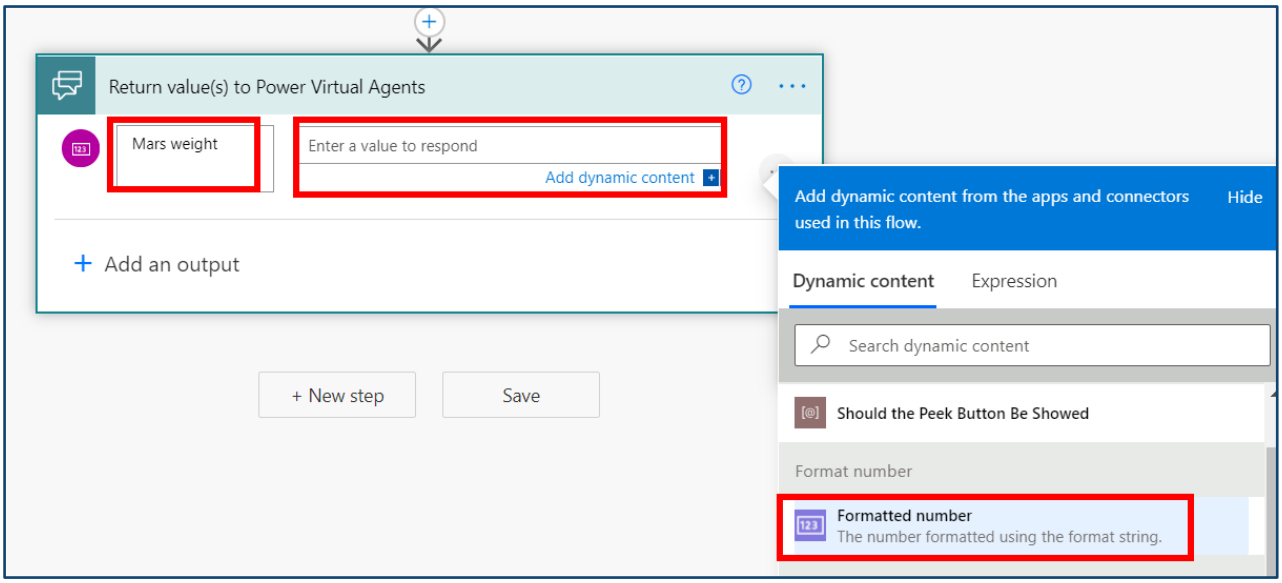
21. Type **###,###,###.00** as the custom format then click OK. You can leave the Locale field blank.

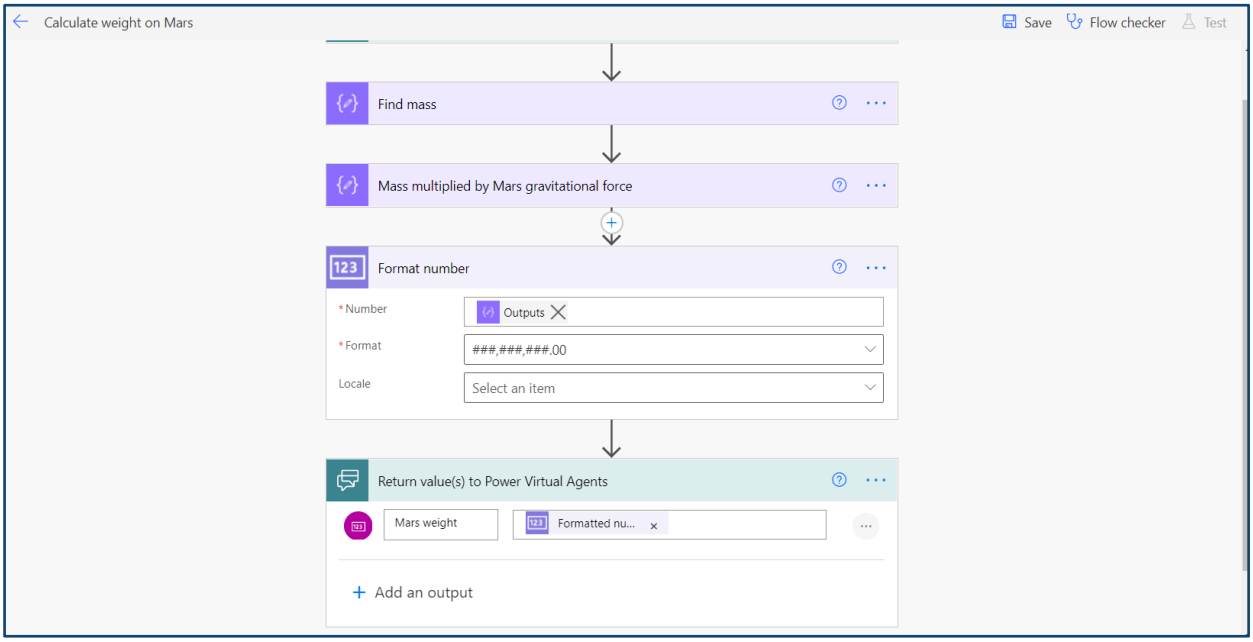


22. The last part of the flow is to return the result back to the chatbot. We will return the number generated from the Format number action. Click on Return value(s) to Power Virtual Agents action to expand it, then click **+Add an output**. Select **number**.



23. Type **Mars weight** as the name of the output. In the value field next to the name, add the **Formatted number** dynamic content show.

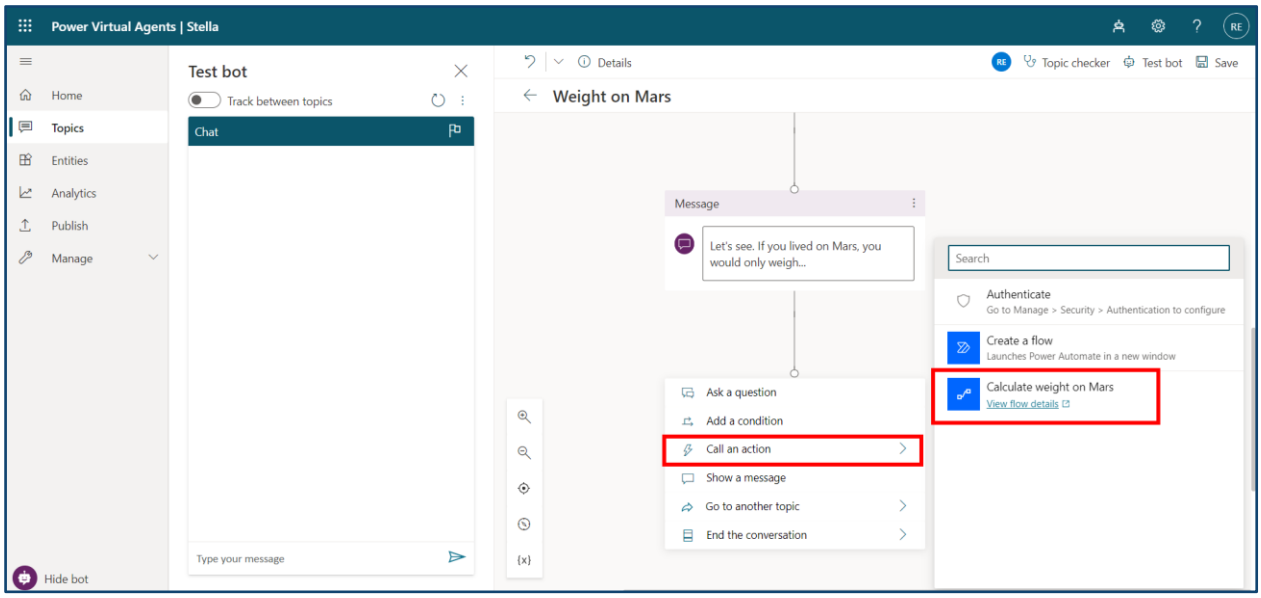




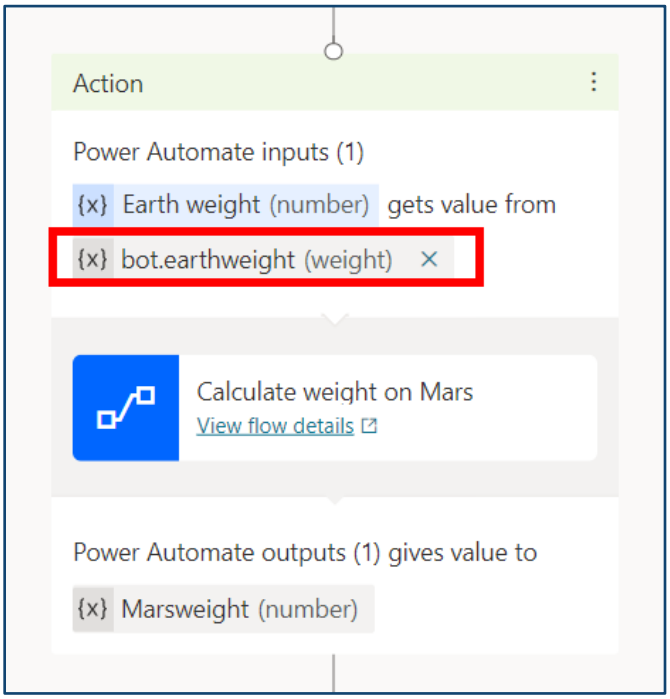
24. **Save** the flow.

25. Return to your Power Virtual Agents window. You should still have the Weight on Mars topic open (or if not, open it). You will now connect the flow into the topic and continue building the conversation.

26. Under the last message node, add **Call an action** and select the **Calculate weight on Mars** flow. If you don't see the flow appear, save the topic and refresh the page.



27. Set the Power Automate input to get value from the **bot.earthweight** variable as shown below.

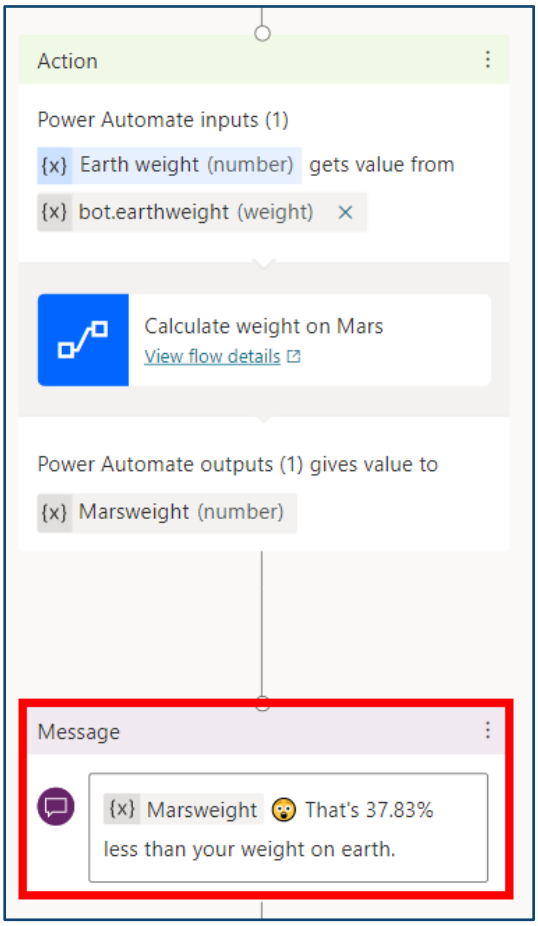


3. Continue building the topic

1. Add a new message node underneath the last step. Enter the following text in the message node:

   That's 37.83% less than your weight on earth.

   At the beginning of the message, click the {x} button to add the Marsweight variable. You can also add an emoji as shown in the message. To add an emoji, press **Windows Key** + **.** key on your keyboard to bring up the emoji options.

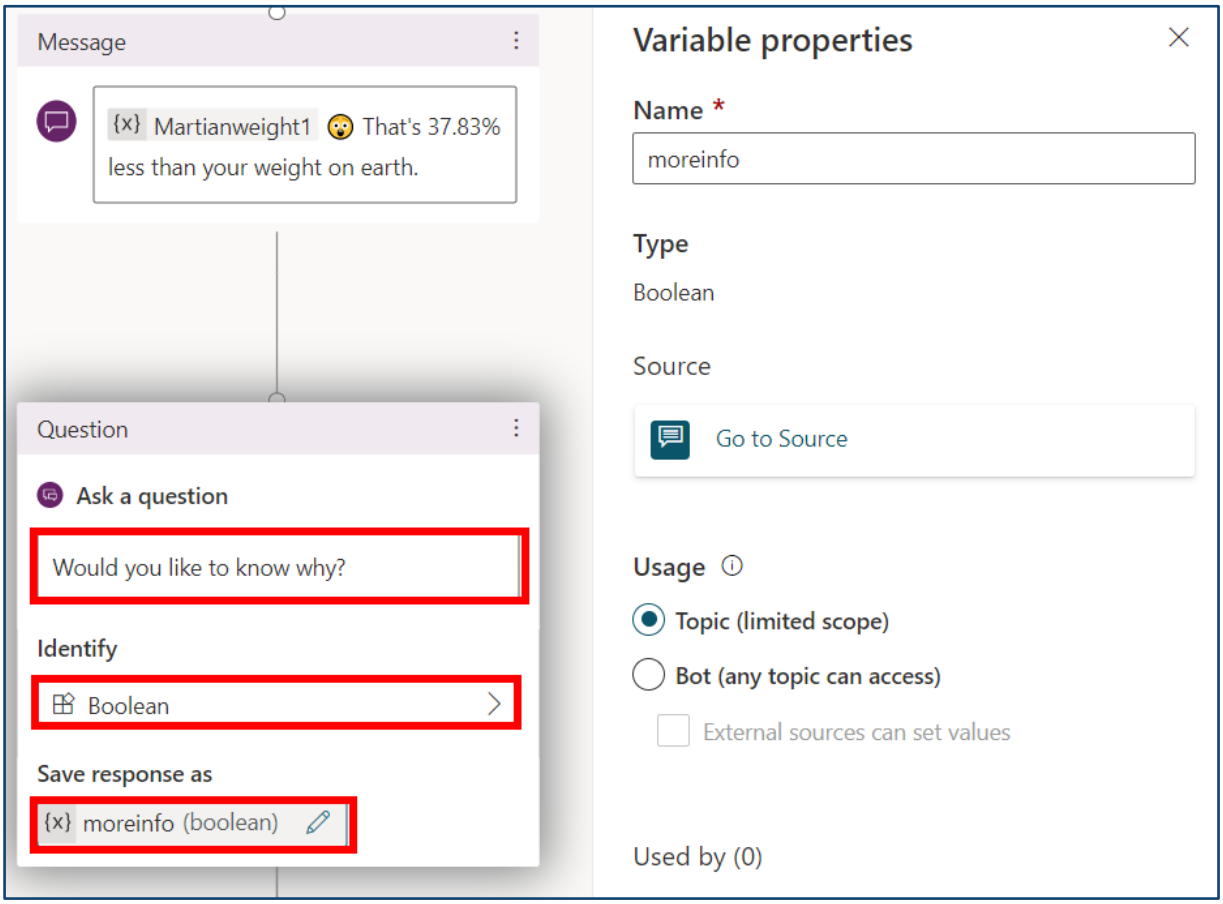


2. Add a question node underneath the message. For the question, type the following:
   Would you like to know why?

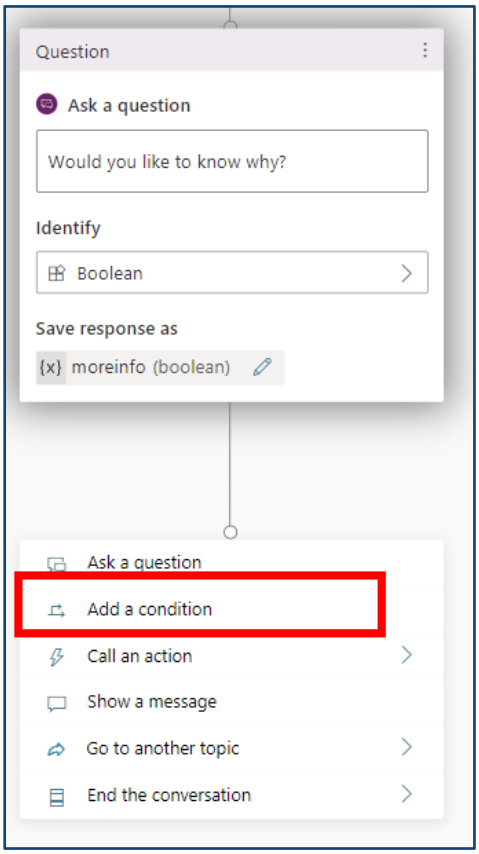
   Set the Identify field to **Boolean.**

   Click on the pen icon next to the variable name, and rename to variable to **moreinfo**

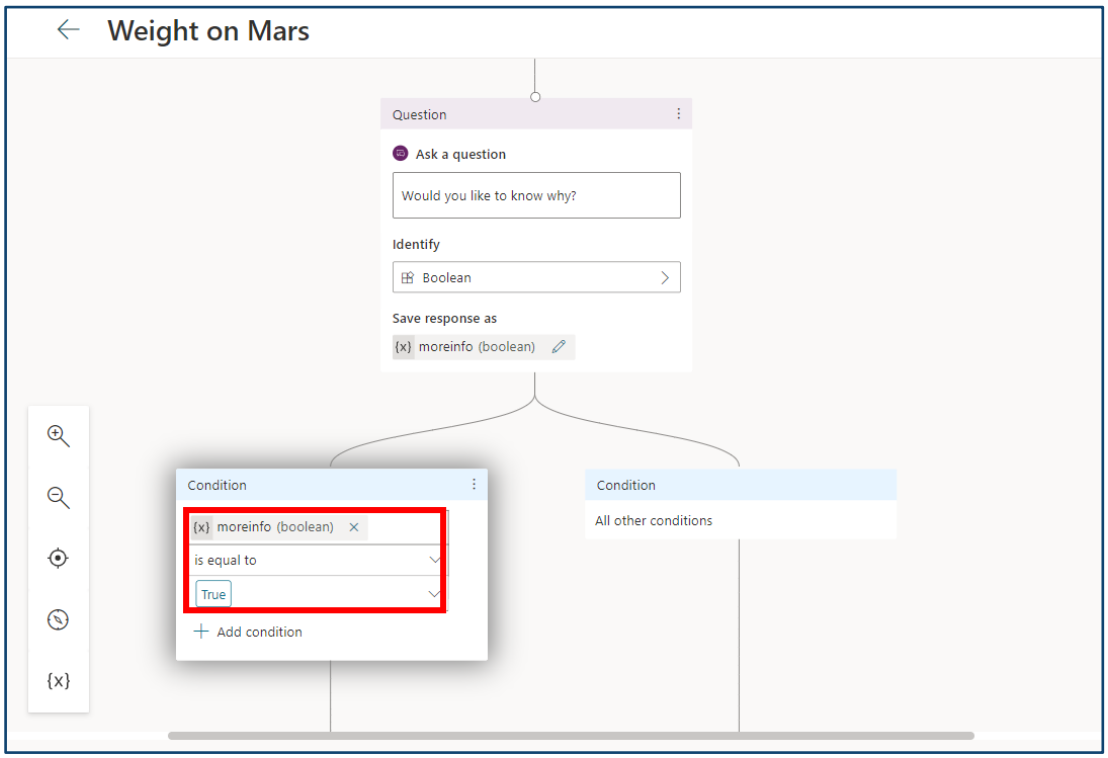
   The variable's usage should be set top **Topic**.



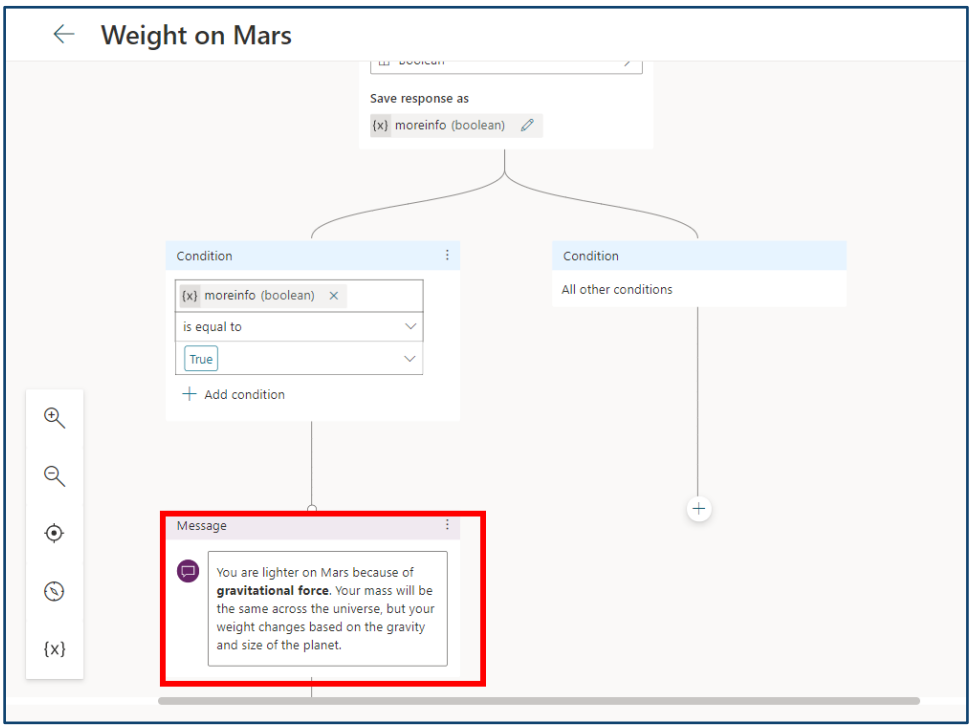
3. Add a condition node underneath the question.



4. Set the first condition node to: **{x} moreinfo is equal to True**.



5. Add a new message node underneath the True condition. Enter the following message:
   You are lighter on Mars because of **gravitational force**. Your mass will be the same across the universe, but your weight changes based on the gravity and size of the planet.

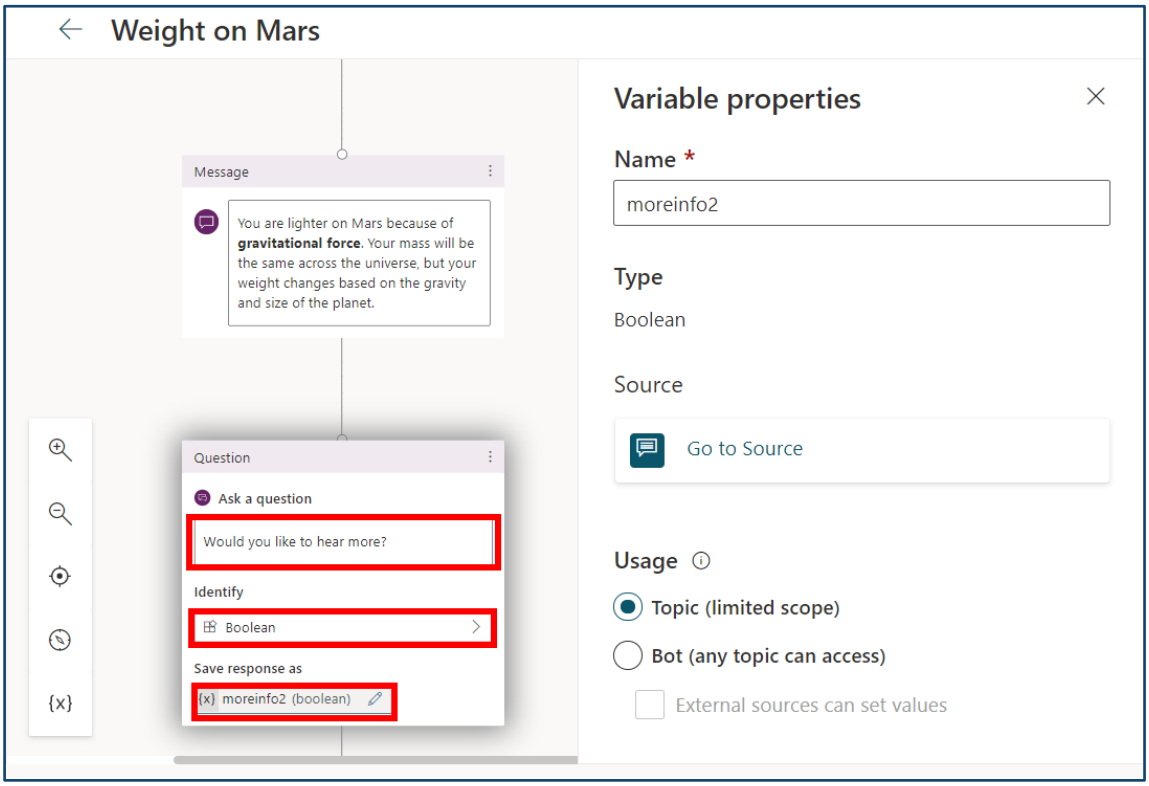


6. Add a question underneath the last message node. For the question, type the following:
   Would you like to hear more?

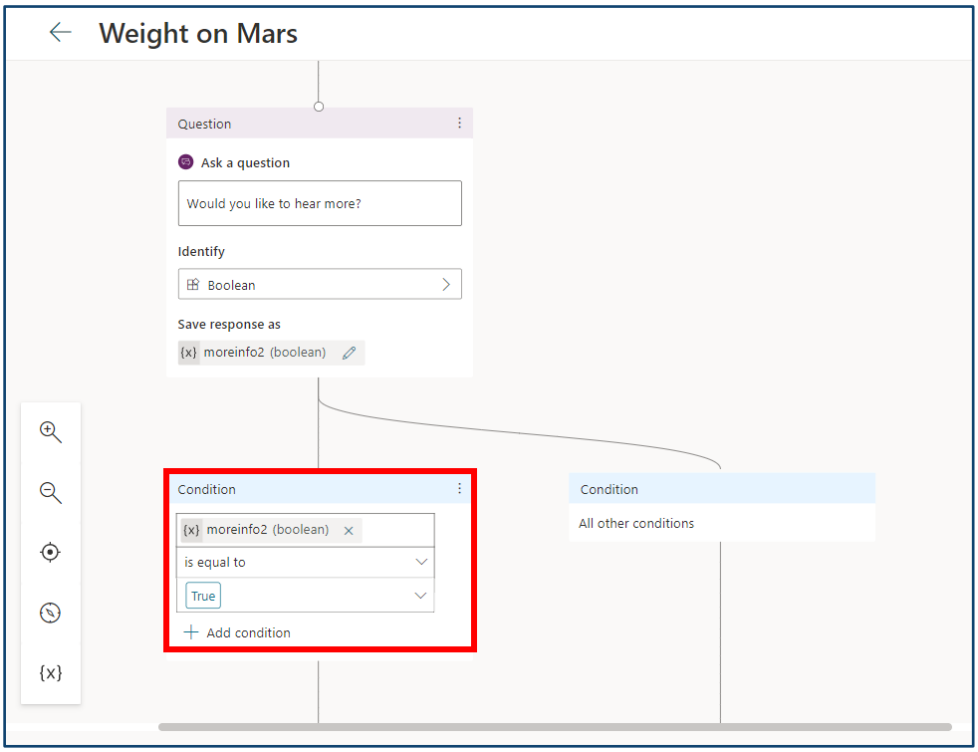
   Set the Identify field to **Boolean.**

   Click on the pen icon next to the variable name, and rename to variable to **moreinfo2**

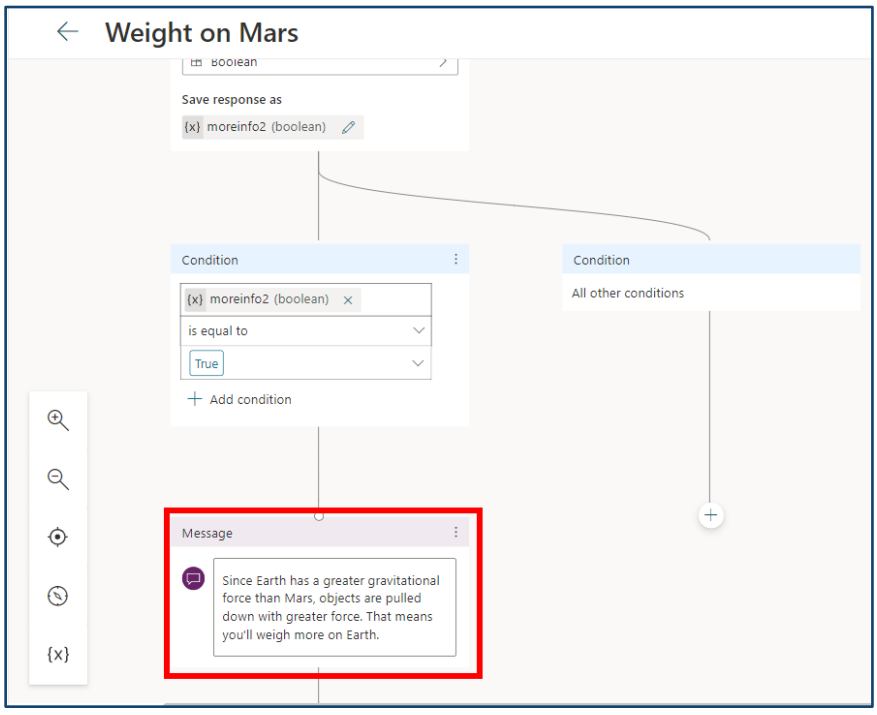
   The variable's usage should be set top **Topic**.



7. Add a condition node underneath the question. Set the first condition node to: **{x} moreinfo2 is equal to True**.



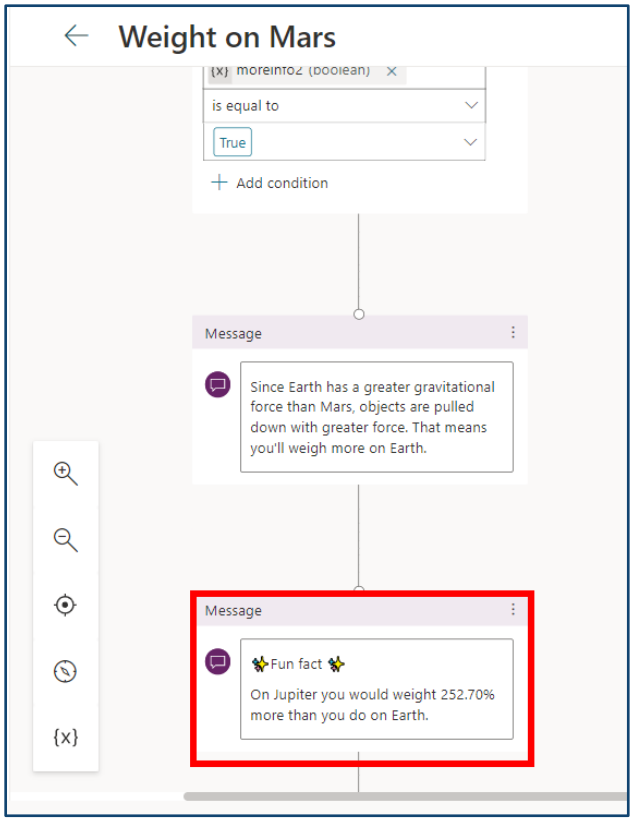
8. Add a new message node underneath the True condition. Enter the following message:
   Since Earth has a greater gravitational force than Mars, objects are pulled down with greater force. That means you'll weigh more on Earth.



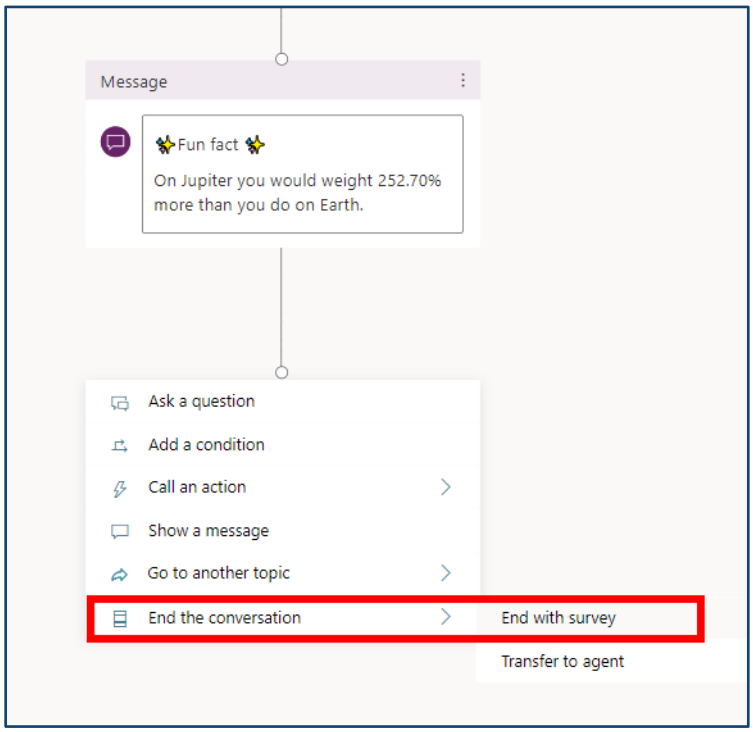
9. Under the last message, add a new message node with the following text:

   Fun fact
   On Jupiter you would weight 252.70% more than you do on Earth.

   You can customise it with emojis as shown.

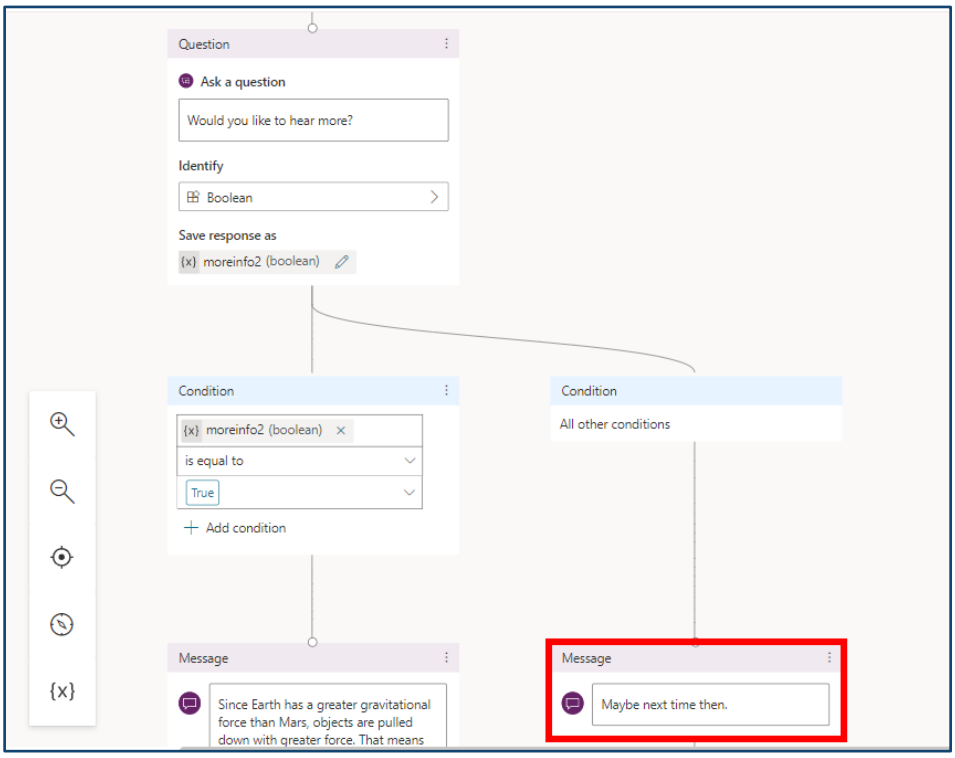


10. Under the last message, add a node to **End the conversation** > **End with survey**.

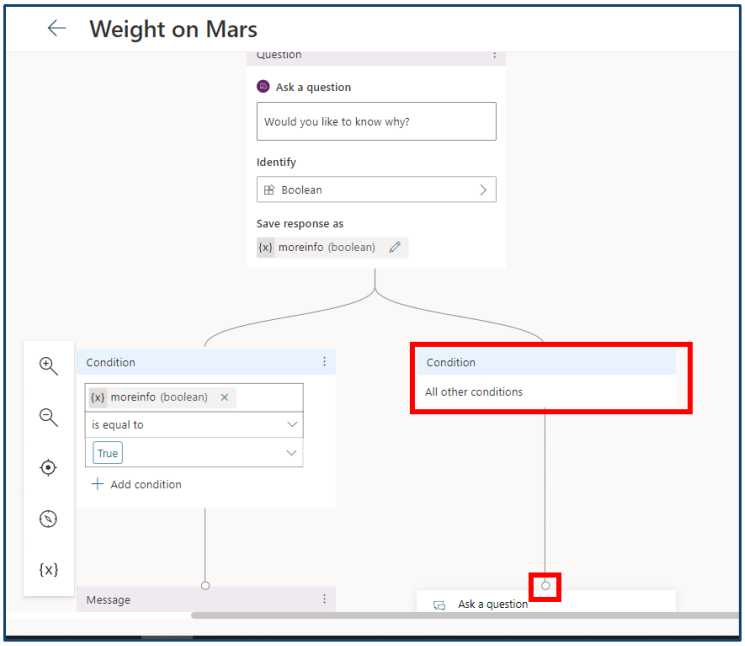


11. Go back up to the question node for *Would you like to hear more?*. Under the **All other conditions** node, and a message node with the following text.

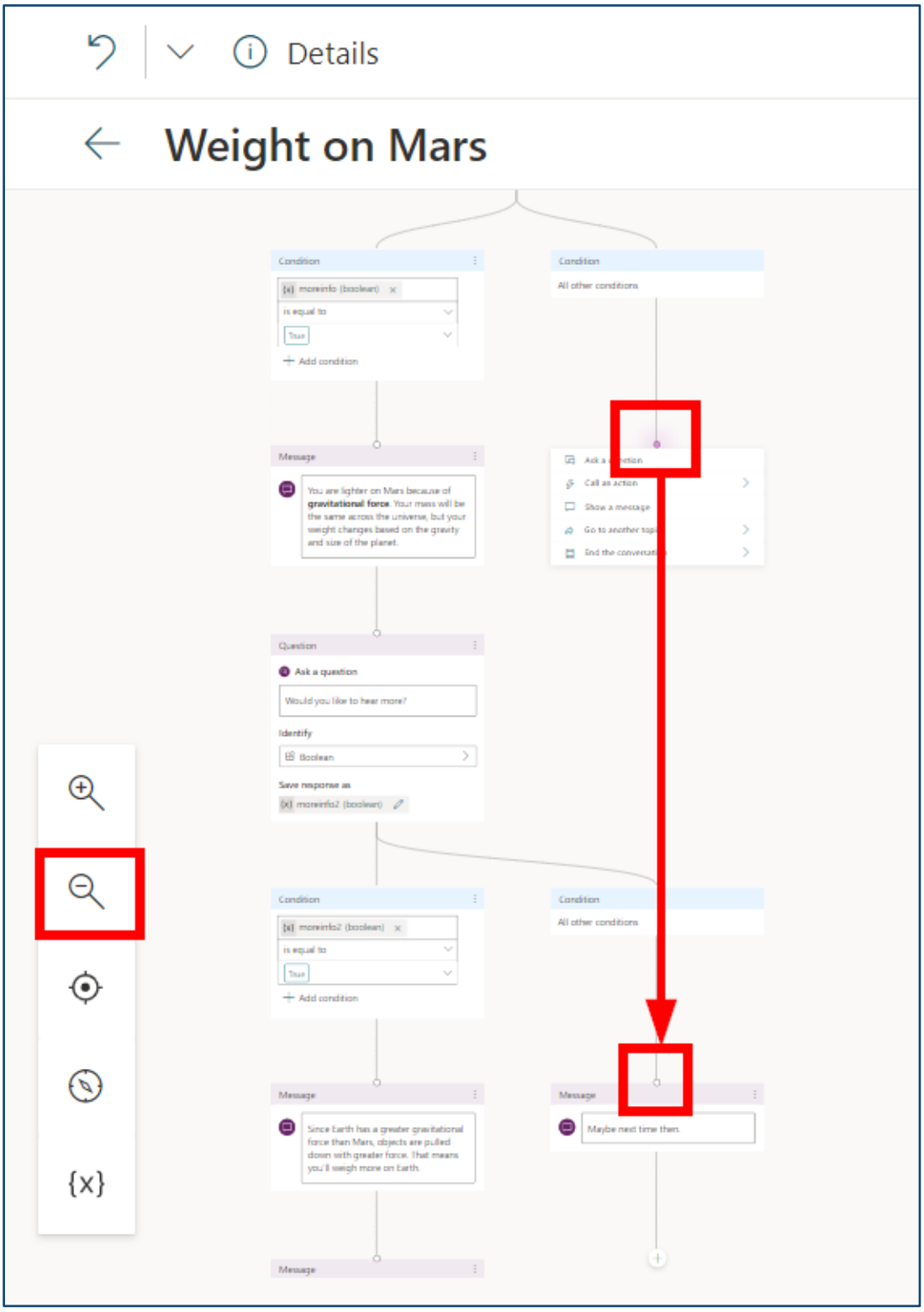
    Maybe next time then.

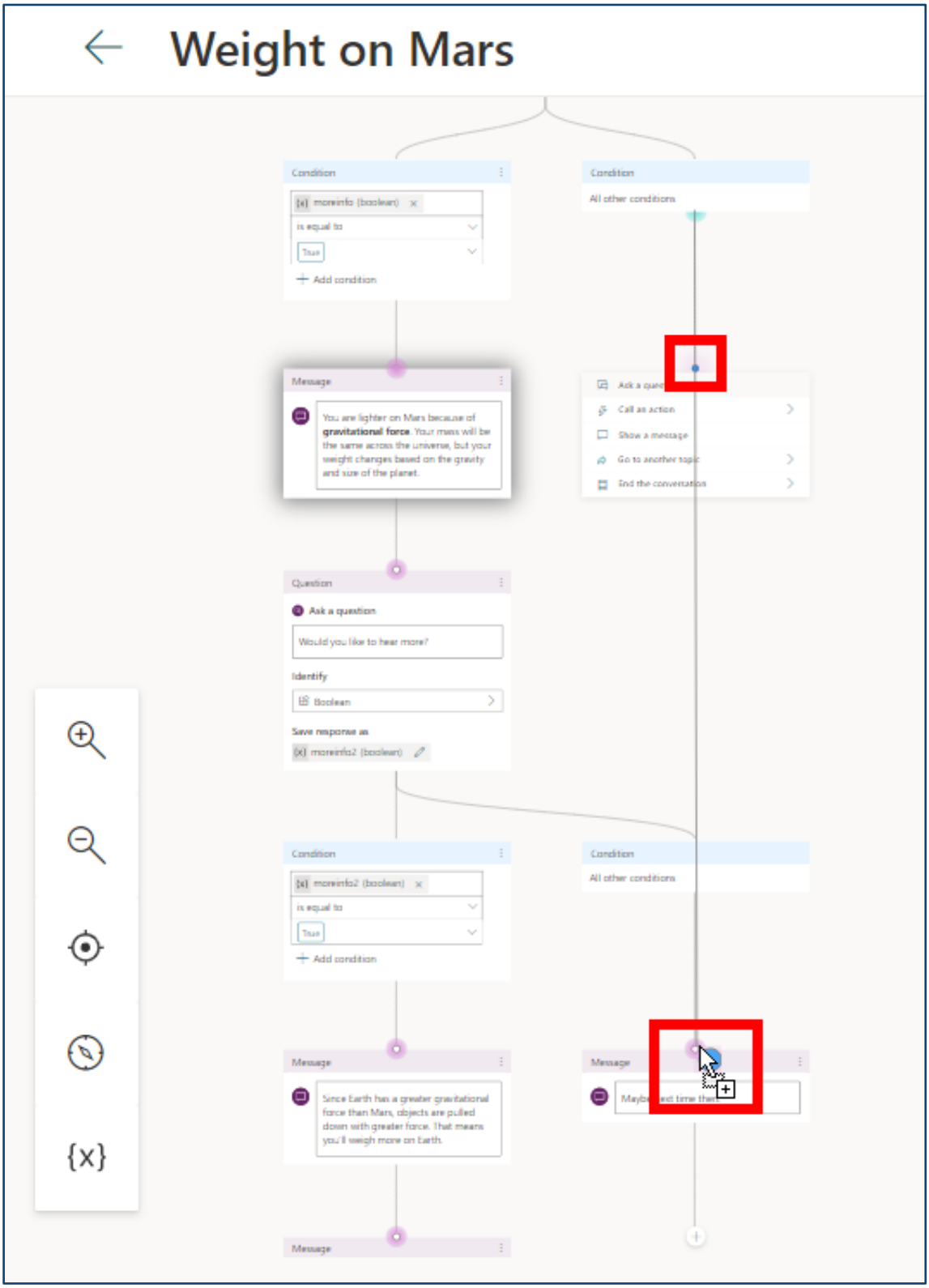


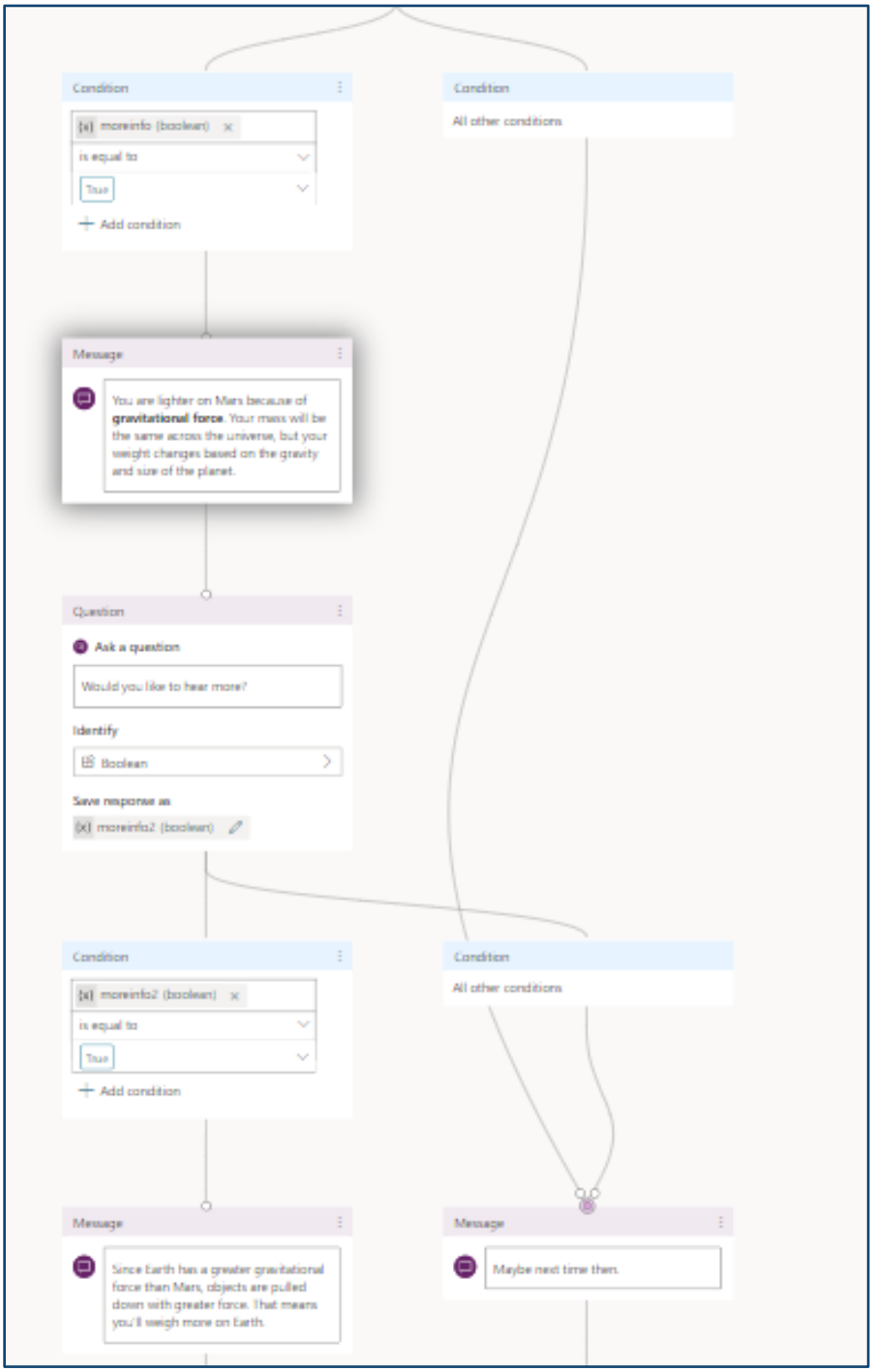
12. Go back up to the question node for *Would you like to hear more?*. Under the **All other conditions** node, click the **+** button to add a new node. You will need to click and drag the icon indicated in the screenshot below ( )down to the same icon on the message node for *Maybe next time then*.



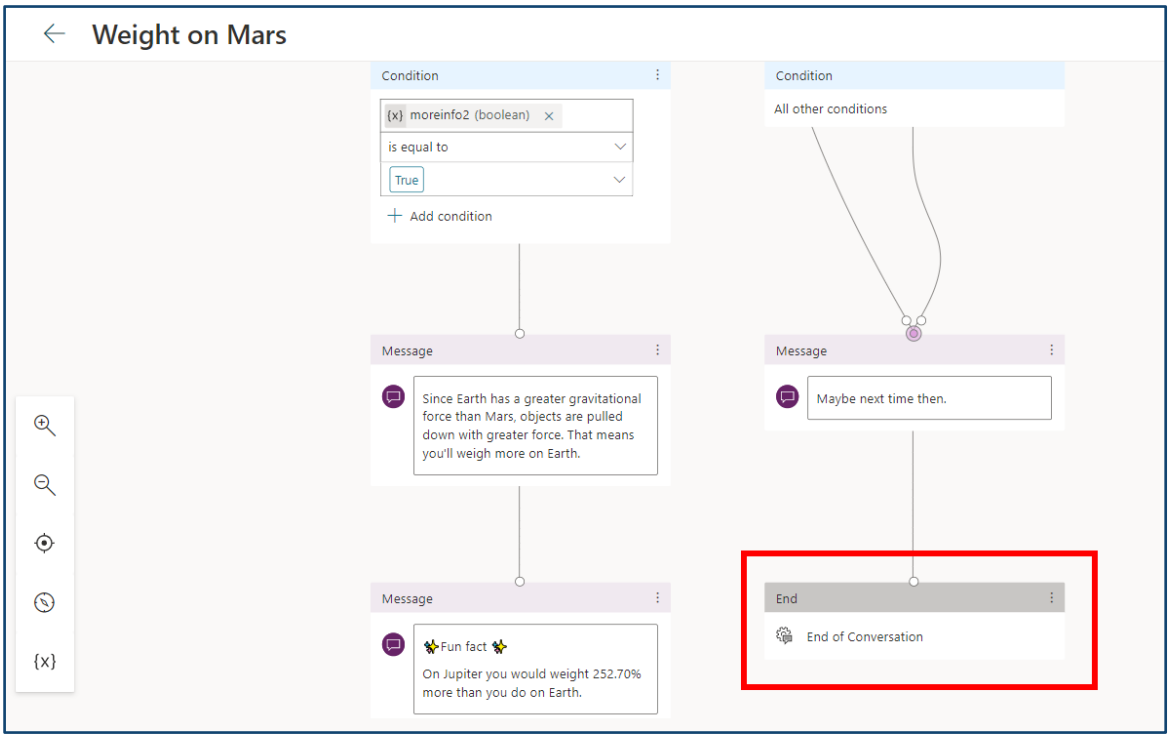
The following sceenshots show you how to link the 2 nodes. You will likely need to zoom out (using the magnifier button) so that both nodes are visible on the screen. This step may be tricky as you need to make sure you click exactly on the icon and drag and drop it on top of the icon for the *Maybe next time then* message node.




Weight on Mars
Condition
moreinfo (boolean)
is equal to
True
Add condition
Condition
All other conditions
Message
You are lighter on Mars because of gravitational force. Your mass will be the same across the universe, but your weight changes based on the gravity and size of the planet.
Call an action
Show a message
Go to another topic
End the conversation
Question
Ask a question
Would you like to hear more?
Identify
Boolean
Save response as
moreinfo2 (boolean)
Condition
moreinfo2 (boolean)
is equal to
True
Add condition
Condition
All other conditions
Message
Since Earth has a greater gravitational force than Mars, objects are pulled down with greater force. That means you'll weigh more on Earth.
Message
Message


Condition
moreinfo (boolean)
is equal to
True
Add condition
Condition
All other conditions
Message
You are lighter on Mars because of gravitational force. Your mass will be the same across the universe, but your weight changes based on the gravity and size of the planet.
Question
Ask a question
Would you like to hear more?
Identify
Boolean
Save response as
moreinfo2 (boolean)
Condition
moreinfo2 (boolean)
is equal to
True
Add condition
Condition
All other conditions
Message
Since Earth has a greater gravitational force than Mars, objects are pulled down with greater force. That means you'll weigh more on Earth.
Message
Maybe next time then.

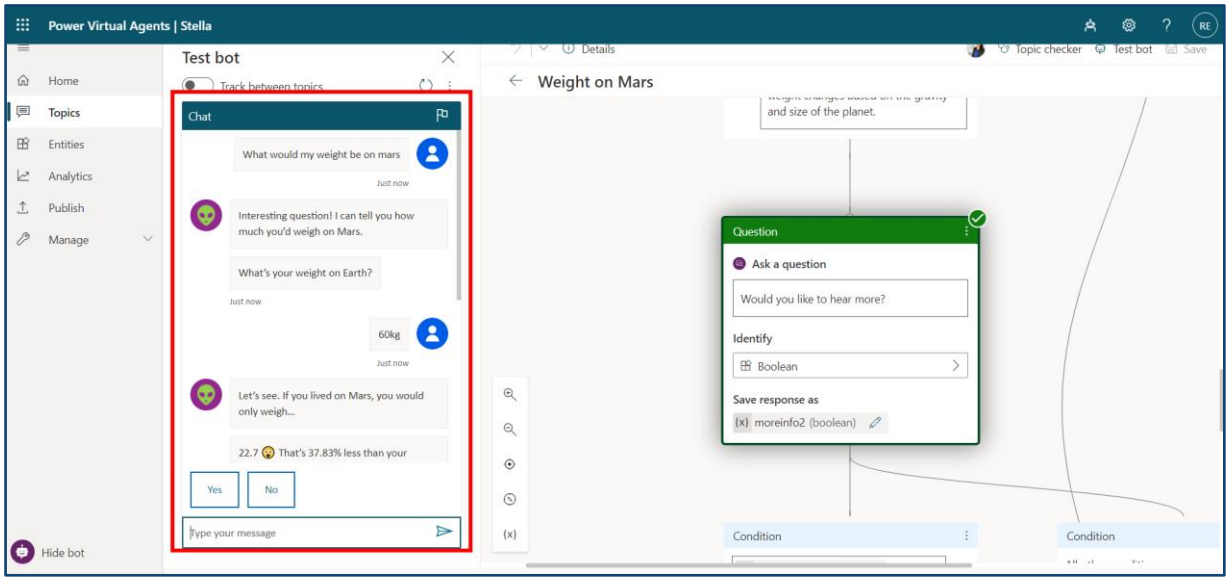
13. Zoom back into the screen using the magnifier button. Under the *Maybe next time then.* message node, add a node to **End the conversation** > **End with survey**.



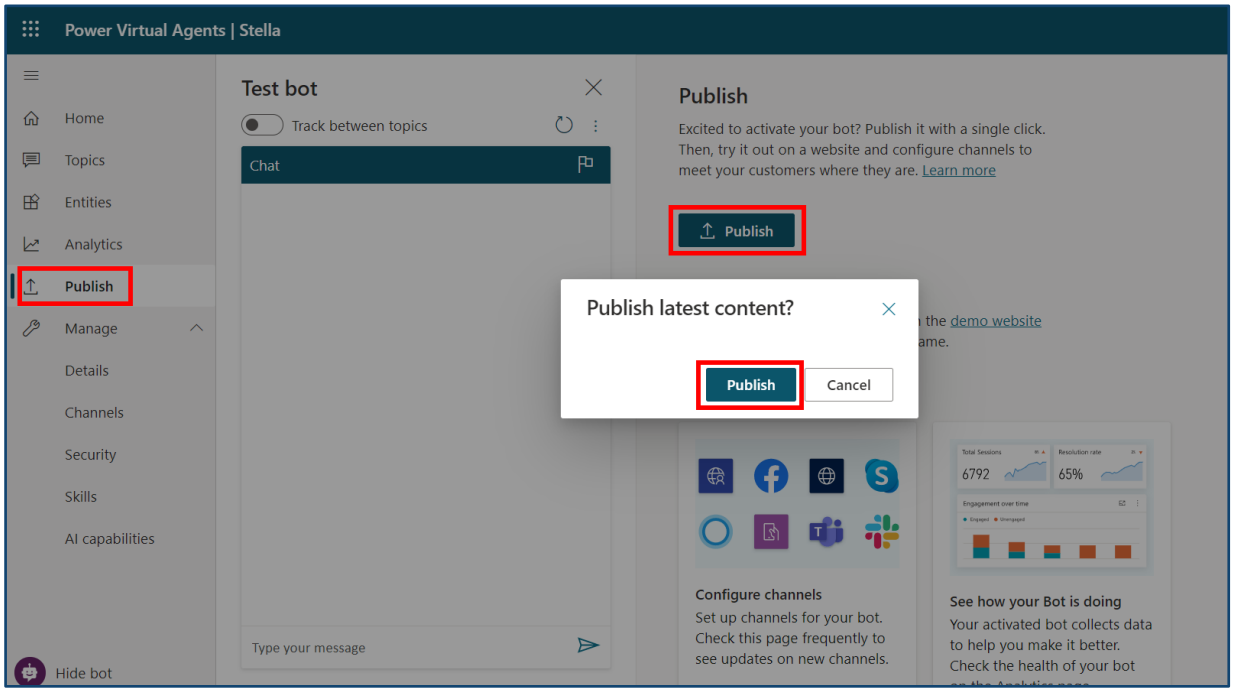
14. Save the topic.

4. Test and publish the bot

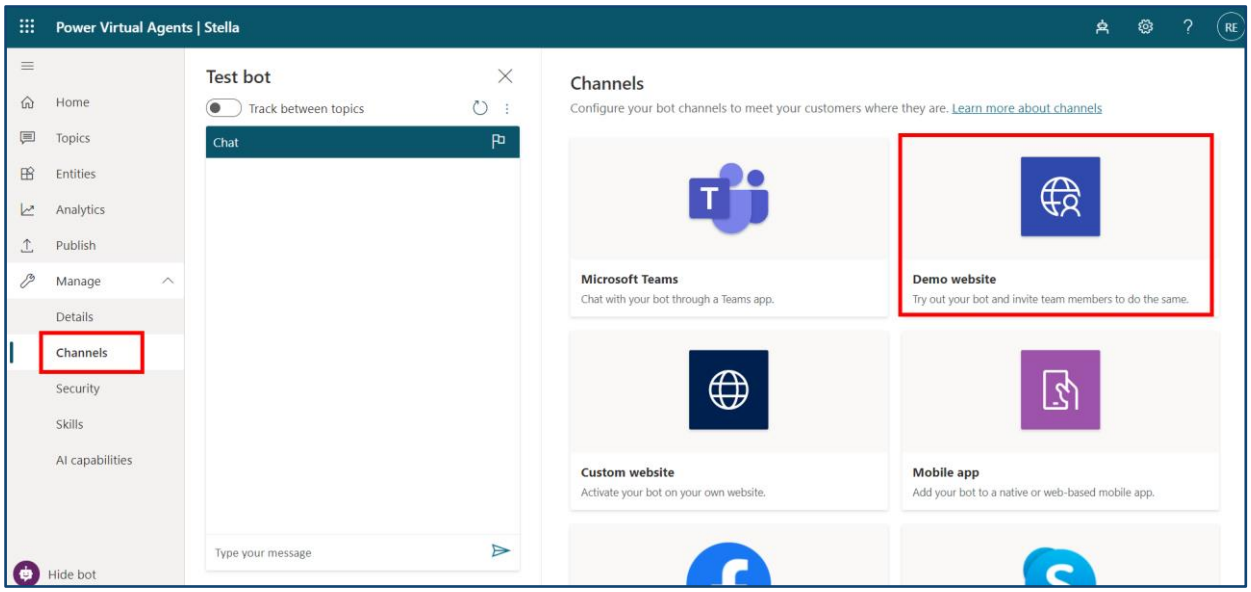
1. Using the test bot pane, enter in one of the trigger phrases to start the conversation and test out the topic.



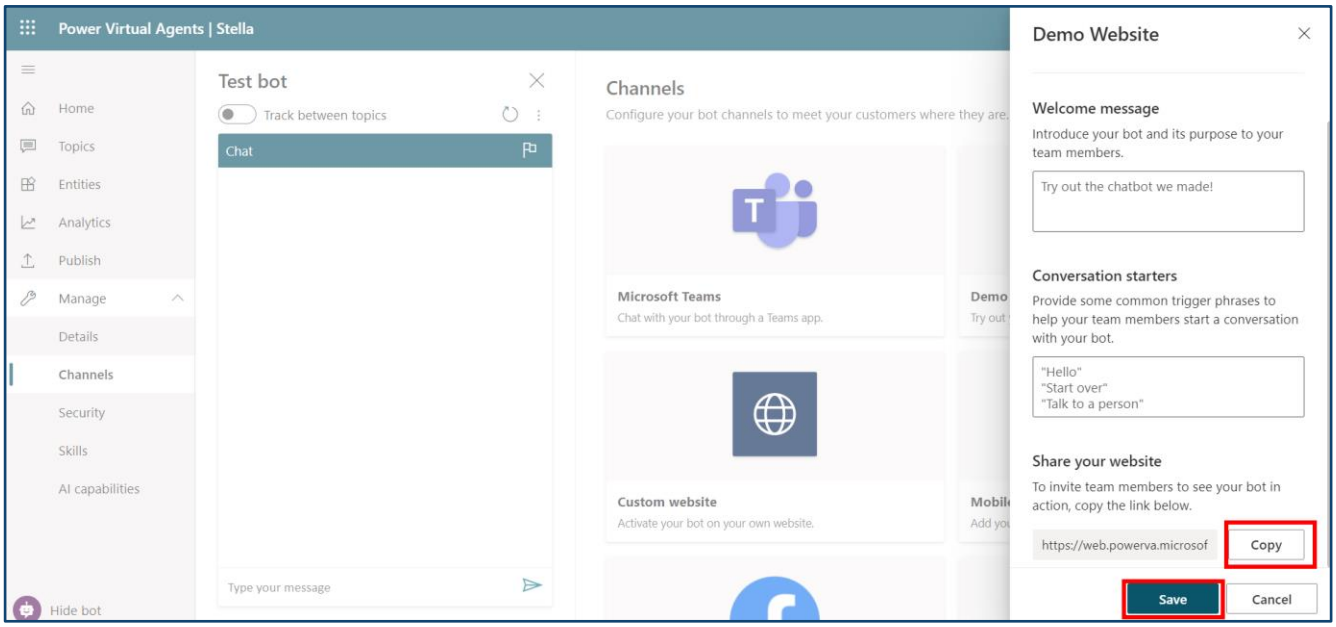
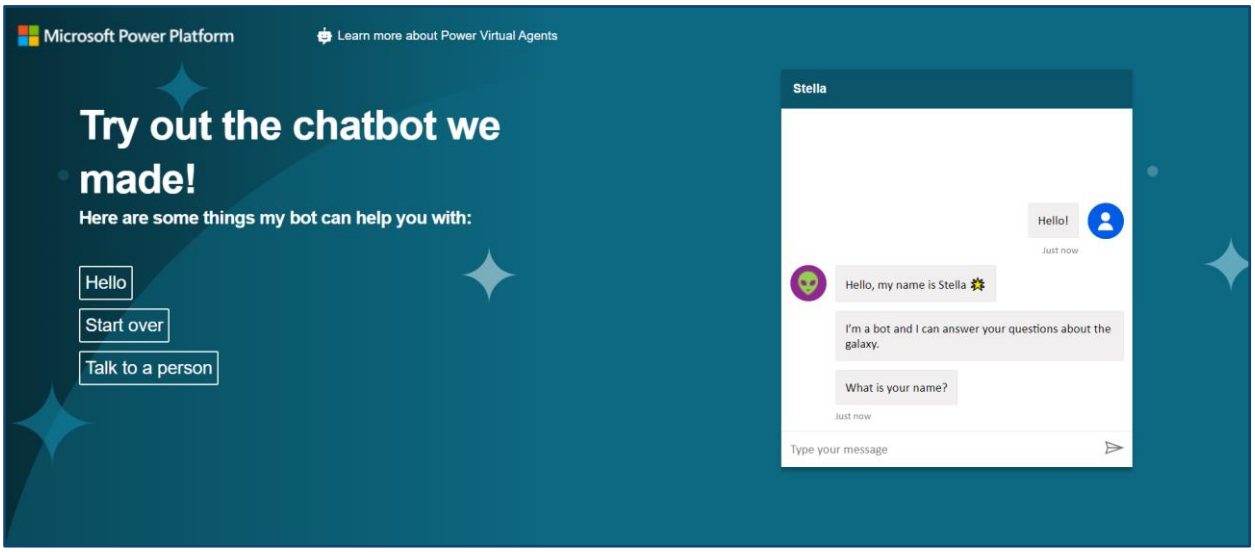
2. You can now publish the bot and test it out on the demo website. Go to the **Publish** area and click on the **Publish** button. Click to confirm Publish latest content.



3. You can get a link to a demo website to try out the bot. This link can be shared with anyone, so pass it along and show others what you have made! Click **Channels** > **Demo website.**



4. Note that you can customise the Welcome message if you like. Click Save if you make any changes. The Share your website link can be shared with anyone, so pass it along and show others what you have made! Copy the link, and paste it in a new browser tab.



5. On the demo website, you can interact with your bot.