Problem solving

In order to solve any problem you need to plan your solution.

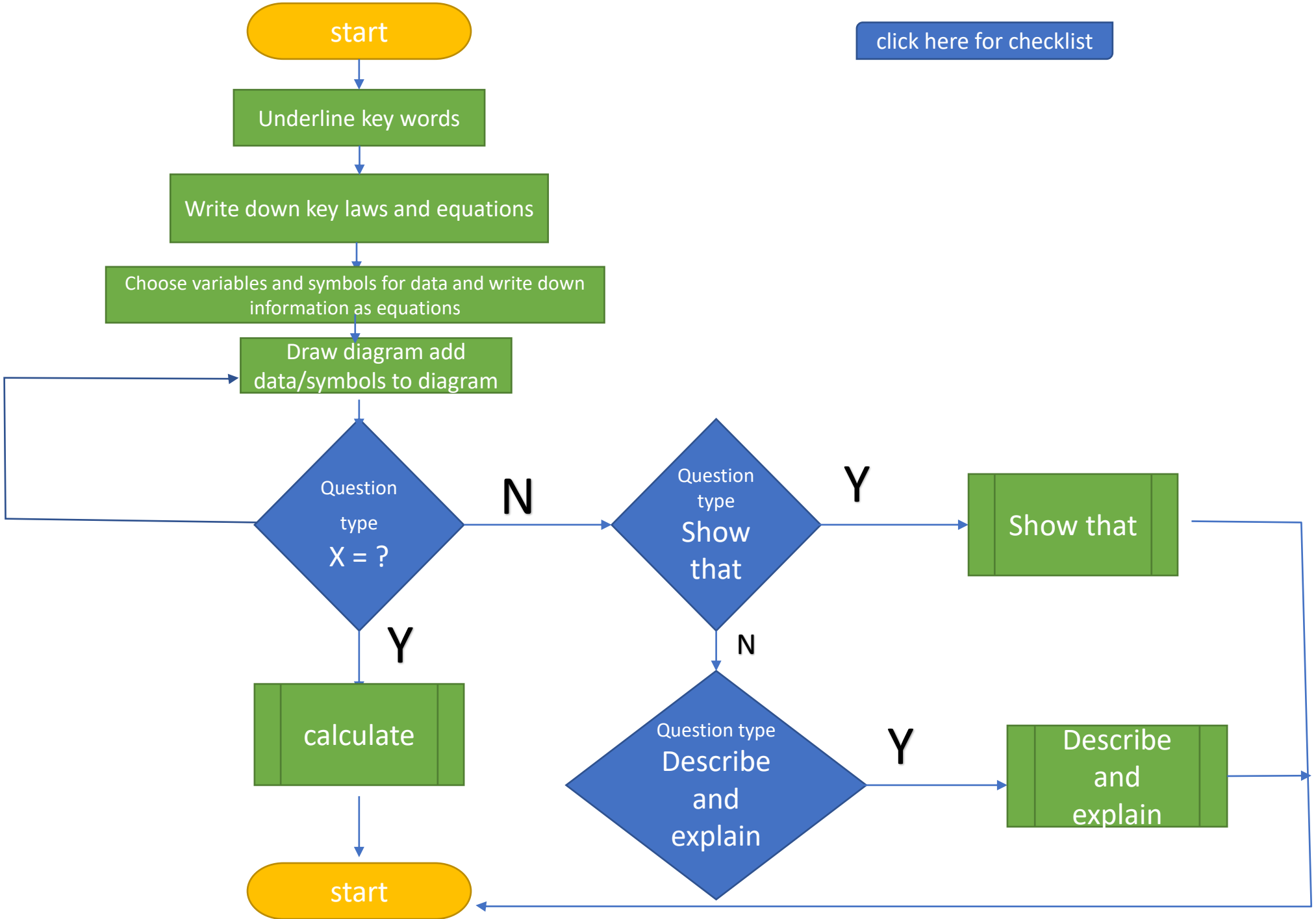
How to solve a physics or maths problem ?

The first step must **not** be to reach for the calculator.

To start you need your ……

And then you need …..

Checklist of steps to solve problems


start
click here for checklist
Underline key words
Write down key laws and equations
Choose variables and symbols for data and write down information as equations
Draw diagram add data/symbols to diagram
Question type
X = ?
N
Question type
Show that
Y
Show that
Y
calculate
N
Question type
Describe and explain
Y
Describe and explain
start

Describe and explain

Initially you need to provide a statement or definition of some of the key words within the question. Such statements or definitions come from the law/rules /equations that you have learnt. This is why it is so important to underline key words thereby avoiding missing something vital.

Describe requires more detail than just a statement (or definition), often an example will help meet the requirement of the question.

Explain requires justification for your statements and examples, again using the law/rules /equations that you have learnt. In an answer to such a question you should include words and phrases like *because*, *as a result of* …

return

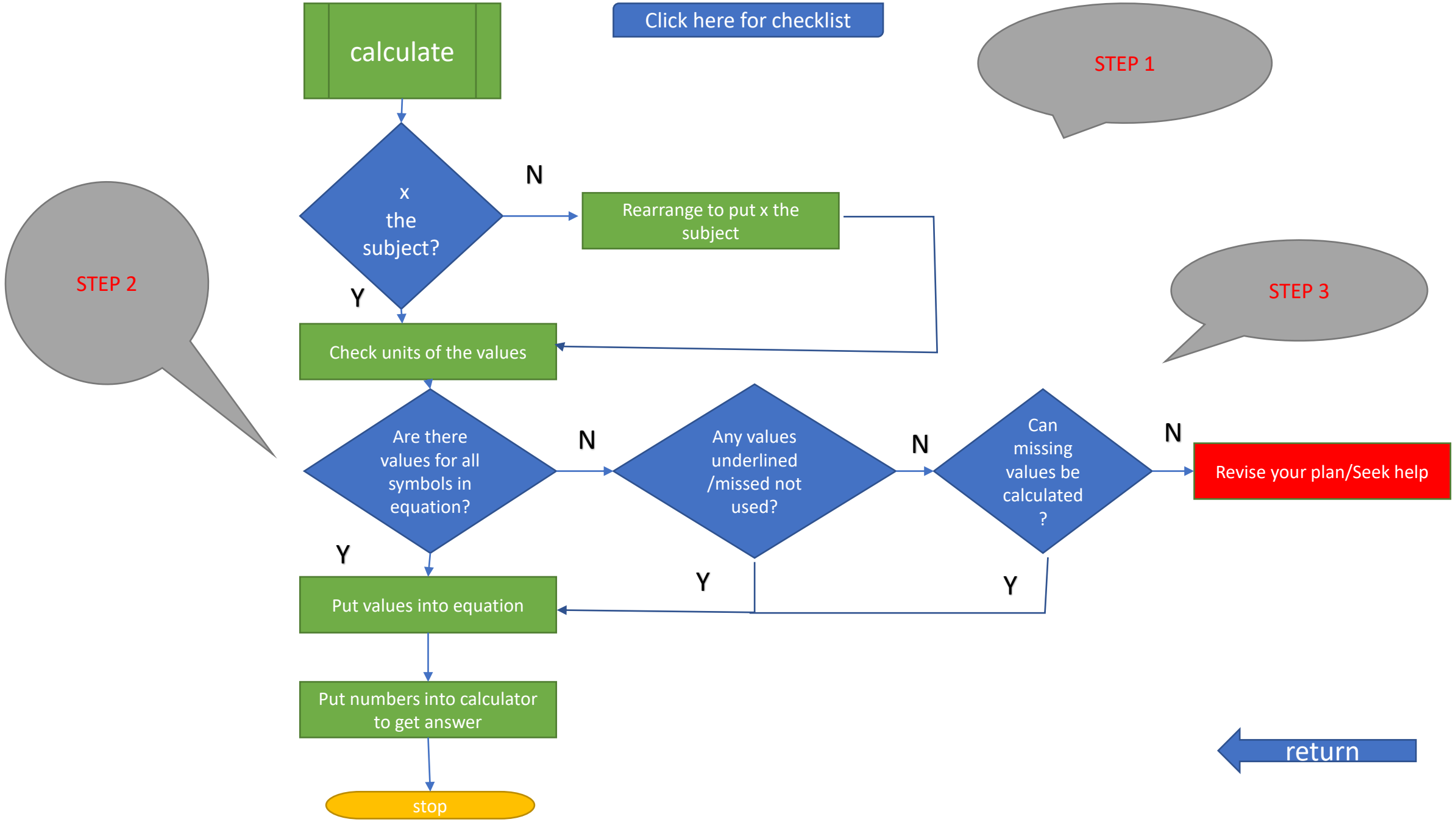
Show that

This is similar to a calculate question but…

In a *show that* answer, you have been given the answer in the question, so it is important to write down all the steps of your calculation.

In addition, it is important to present your answer, initially to a greater level of accuracy than the value given in the question, e.g. the question may ask you to show that g is about $10ms^{-2}$. Your calculation need to include the value as 9.8 ms^{-2} and then a statement that this will round to $10ms^{-2}$.

return


calculate
Click here for checklist
STEP 1
STEP 2
STEP 3
x the subject?
N
Rearrange to put x the subject
Y
Check units of the values
Are there values for all symbols in equation?
N
Any values underlined /missed not used?
N
Can missing values be calculated ?
N
Revise your plan/Seek help
Y
Y
Y
Put values into equation
Put numbers into calculator to get answer
stop
return