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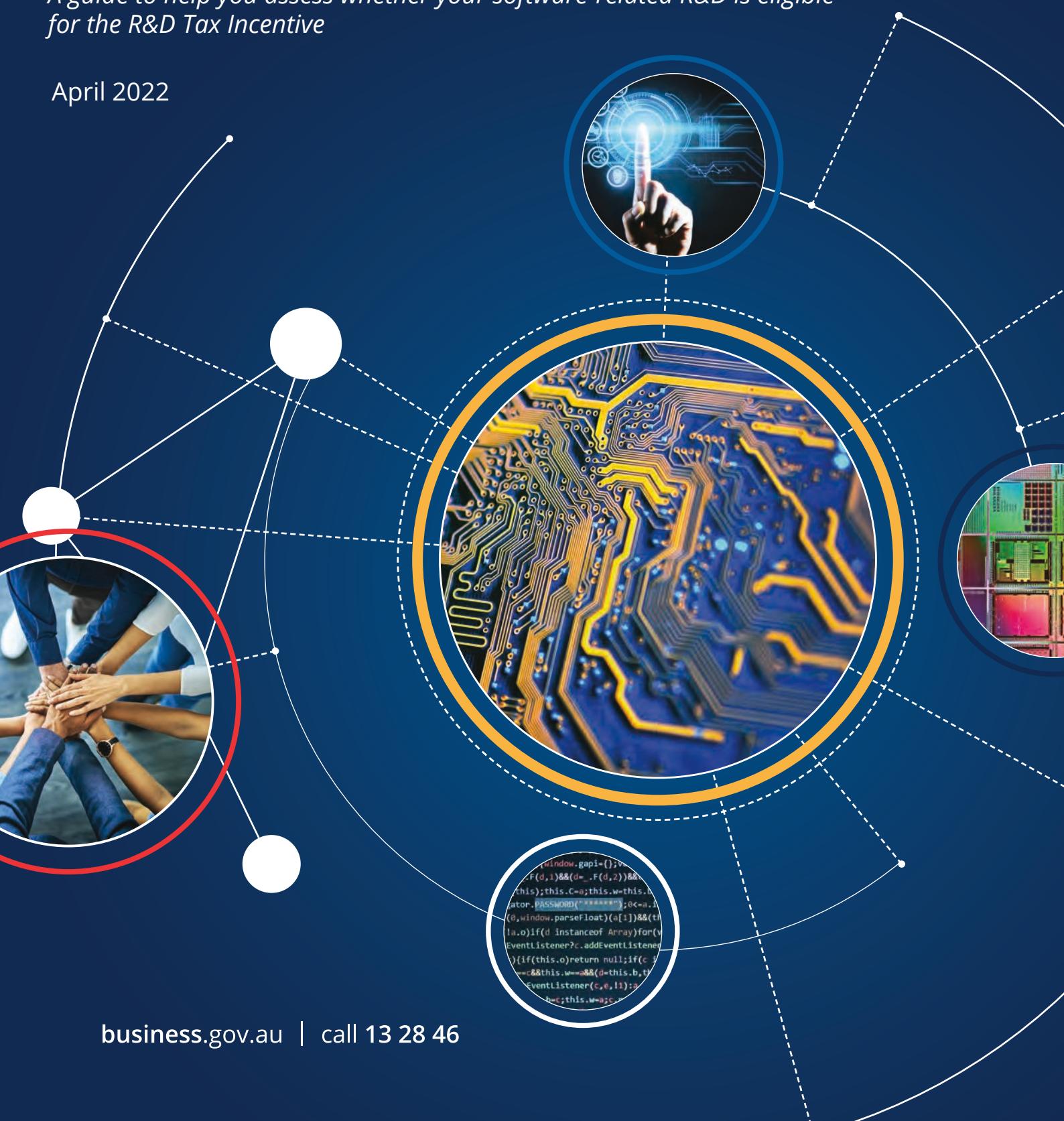
# AusIndustry

## R&D Tax Incentive

# **Software-related activities and the Research and Development (R&D) Tax Incentive**

# *A guide to help you assess whether your software-related R&D is eligible for the R&D Tax Incentive*

April 2022



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# Section one: Introduction

## About the R&D Tax Incentive

### What is the R&D Tax Incentive?

The Research and Development Tax Incentive (R&D Tax Incentive) encourages increased R&D activities that generate knowledge for the benefit of the Australian economy. It does this by offering a refundable tax offset for entities with an annual turnover of under \$20 million, and a non-refundable tax offset for entities with an annual turnover of more than \$20 million. The Department of Industry, Science, Energy and Resources (the department), on behalf of Industry Innovation and Science Australia (IISA), administers the R&D Tax Incentive with the Australian Taxation Office (ATO).

### About this guide

The [Guide to Interpretation](#) is our primary guide to explain the key terms of the R&D Tax Incentive and the way we apply [sections 355-25 and 355-30 of the Income Tax Assessment Act](#) (ITAA 1997). You should read the Guide to Interpretation first, along with the relevant sections of the ITAA 1997.

This guide supplements the Guide to Interpretation, providing explanations of the criteria for eligible R&D, with a focus on what these concepts mean and how to interpret them to determine whether an R&D activity is eligible for the assistance from the R&D Tax Incentive program for software-related activities. Throughout this guide we use the term 'eligible' to mean entities, activities or expenditure that meet the legislative requirements of the R&D Tax Incentive program.

We know from experience that the more information and support you have, the more likely you are to register eligible R&D activities. We are here to support you. If you are unsure about the eligibility of your software-related activities after you read this guide, please contact us on 13 28 46 or attend one of our events or information sessions which can be accessed from:

[business.gov.au/rdti-events](http://business.gov.au/rdti-events).

Other guidance is available on our website at [business.gov.au/rdti](http://business.gov.au/rdti).

**Important note:** Examples we provide are for guidance only and explain how the law operates generally. They are simply expressed, and don't cover all possibilities.

Even if your activities appear like the examples, they still might not be eligible for the R&D Tax Incentive if all of the legal requirements for R&D activities are not met. In addition to considering the guidance you need to assess your activities based on your specific and individual circumstances. You must always assess your activities against the legislation.

# Section two: The R&D Tax Incentive and software-related activities

## Eligible R&D activities

Before we begin, it is important to understand that 'R&D activities' have a specific statutory definition which is set out in sub-section 355-25(1) of the ITAA 1997. This definition may not be the same as the ordinary commercial, engineering or accounting definition of research and development activities. Not all innovation falls within the definition of R&D activities.

The program's definition of R&D activities is designed to ensure that the incentive is directed towards those activities that are unlikely to be done by business in the absence of government support.

The R&D Tax Incentive applies to eligible R&D activities that you conduct and register. Activities are the building blocks that make up a project. When you register for the R&D Tax Incentive, we expect you to describe specific activities you conduct within your project with reasonable detail to allow us to understand how those activities meet the eligibility requirements. It is likely that not all activities within an innovation project will meet the requirements for being R&D activities.

## Core R&D activities

To be eligible for the R&D Tax Incentive you must be undertaking an eligible core R&D activity in Australia.

### **Core R&D activities are experimental activities:**

- a) whose outcome cannot be known or determined in advance on the basis of current knowledge, information or experience, but can only be determined by applying a systematic progression of work that:
  - i. is based on principles of established science, and
  - ii. proceeds from hypothesis to experiment, observation and evaluation, and leads to logical conclusions, and
- b) that are conducted for the purpose of generating new knowledge (including new knowledge in the form of new or improved materials, products, devices, processes or services)

Your activities must meet the criteria at both (a) and (b) to be eligible core R&D activities.

They also must not be excluded activities. Subsection 355-(2) of the ITAA 1997 lists excluded activities.

After you assess that you have conducted or plan to conduct at least one core R&D activity, you can assess whether your project includes any activities that meet the definition of supporting R&D activities. Supporting R&D activities must directly relate to a core R&D activity. In some circumstances you must also conduct them for the dominant (most prevailing or most influential) purpose of supporting a core R&D activity. Detailed information about the eligibility requirements for core and supporting R&D activities is provided in the [Guide to Interpretation](#).

## Software and R&D activities

Software-related activities must meet all of the legislative requirements for being R&D activities to be eligible for the R&D Tax Incentive.

This guide may assist you if the main focus of your business is software development, or if you are conducting software development activities to enable other business or R&D activities.

For example, you may plan a project to develop a new or improved software application. This application may form part of a product or device, or enable service delivery. Alternatively, you might develop software to control a process. As part of your software project, you may conduct eligible R&D activities that you can register for the R&D Tax Incentive.

Let's start by breaking down the core R&D activity criteria and key terms in the context of software-related activities.

## *Outcome cannot be known or determined in advance*

We recognise that companies solve a lot of problems in the course of their ordinary business, including technical problems. In trying to achieve your business objectives, it is possible that you might need to solve problems that involve conducting activities where the outcome cannot be determined in advance because of technical or scientific unknowns, but can only be determined by applying a systematic progression of work.

The key here is that for your activity to be an eligible core R&D activity, the first thing you must be able to show us is:

- that before starting the activity, you established that there was no answer to the technical or scientific unknown, and
- how you established that there were no answers.

We expect you to search widely for an existing way to achieve your activity's goal before you start it. We expect your records to show you did this search.

For an activity to be a core R&D activity, it must not be an excluded activity (see below), and a competent professional in the relevant field **cannot know or determine the outcome** before the activity starts.

You are expected to make reasonable and thorough inquiries before you conclude that an activity has an unknown outcome.

For example, you could undertake a search of Computer Science Journals, major open-source code repositories (such as GitHub) and/or tech blogs, conduct a patent search, consult with your professional network and ask questions on a technology forum, seek advice from experts within your company, or from specialists in the field, including at a university or research centre.

You are not expected to have access to information that is commercial-in-confidence or is the unpublished intellectual property of another company.

Here are things to consider when assessing whether there is a scientific or technological unknown:

- whether an objective is scientifically or technologically possible or how it can be achieved
- whether existing knowledge or capability can be adapted to solve a problem
  - within the same field of science or technology, or
  - from another field of science or technology
- where limitations in the current state of technology hinder the development of a new or improved capability
- a technological constraint that needs to be overcome, with unknowns arising in relation to:
  - whether the output will meet the desired specifications such as response time, reliability or cost, or
  - how the desired specifications can be achieved amongst possible alternative methodologies or solutions
- the use of known processes, technologies and methodologies where the result or outcome is unknown
- system unknowns, where the components of a system and their interactions are known, but the outcome/result of the system cannot be deduced from the outset
- where something has already been shown to be possible but needs further work to make the technology more cost-effective, reliable or reproducible.

Eligible R&D activities may take place, regardless of whether the unknown outcome is actually resolved.

## *Competent professional*

For an activity to be a core R&D activity, a competent professional cannot know or determine the outcome of the activity in advance.

A competent professional is a hypothetical person who has access to the knowledge, skills and qualifications needed to demonstrate expertise in an appropriate field. They have access to all of the current knowledge available in the relevant field from anywhere in the world, provided that the information or experience is publicly available or reasonably accessible.

An activity will qualify as a core R&D activity when a competent professional cannot determine the outcome of that activity without applying a systematic progression of work that is based on principles of established science.

## *Systematic progression of work*

The outcome needs to be one that you can only determine by applying a systematic progression of work that is based on principles of established science.

You have to show how your systematic progression of work proceeds from hypothesis to experiment(s), observation and evaluation, and leads to logical conclusions.

When registering your R&D activities, you will be required to document those activities in your application for registration accessed from the [R&D Tax Incentive portal](#).

For some R&D activities, the systematic progression of work may progress over multiple years.

Registrations that do run over multiple years should show a progression of work over that period, outlining how the R&D activities have changed and progressed over time.

We expect you to record:

- the hypothesis that you are testing
- what the experiment, or set of related experiments, was and how it was conducted
- what the results of the experiments were, and
- what conclusions were drawn from the results.

While the R&D Tax Incentive is a self-assessment program, we may review the activities in your application. Should a review take place, you will be asked to provide records of your activities. We expect that records you make before or around the time you conduct your activities will show that the activities took place in the year of claim, and meet the legislative requirements. See the [What records do I need to keep?](#) section of this guide for further information.

Each of the elements of a systematic progression of work is explained further in the following sections, together with how the concept applies to software development methodologies.

## *How the program applies to software development methodologies*

If you are conducting software-related activities we understand that you may conduct your R&D activities using methodologies like Agile, Waterfall, Rapid and similar. You will need to show that the outcome could not be determined in advance and that your methodologies were either used as part of a systematic progression of work that you applied when conducting a core R&D activity, or were used in supporting R&D activities in relation to a core R&D activity.

You may conduct some of the following activities when you conduct experiments to test your [hypothesis](#). We expect your records to show these activities were a part of a systematic progression of work:

- system testing
- requirements testing
- data mapping and data migration testing
- testing the efficiency of different algorithms that are already known to work
- testing websites in operation by measuring the number of hits
- digital transformation activities - transforming predominantly manual processes to digital
- upgrading technology
- routine computer and software maintenance
- data manipulation.

If you do not conduct these activities within a systematic progression of work as part of a core R&D activity, they may be supporting R&D activities. In this case, they would need to directly relate to a core R&D activity.

We recognise that some routine testing activities, such as debugging (identifying and fixing errors in codes) and beta testing, can be part of a core R&D activity where they constitute part of a systematic progression of work as required by the legislation. Your activities must meet all requirements of section 355-25 of the ITAA 1997 to be eligible as core R&D activities.

## **What is a hypothesis?**

A hypothesis is:

- your idea or theory to achieve a particular result
- how you might achieve that result, and
- why that result may not be achievable.

We expect you to show how you formed your hypothesis based on your research into the current available knowledge. There should be a clear link between the goal you want to achieve, the activity you are conducting and why you think that activity could achieve your goal.

Your hypothesis will direct the design and conduct of your experiment.

For example, you might find information from multiple sources stating that a particular compression algorithm can compress a 12-megapixel image, but will exceed the power limits of existing processors. You might find other information that relates to methods to increase the efficiency of compression algorithms so that they will work within existing power limitations. This might give you an idea about how to improve an existing compression algorithm so that it can achieve a particular result, for example, to compress a 12-megapixel image without exceeding the limits of the low-power processor. Alternatively, you might have an idea about how to create a new algorithm. Your hypothesis would be that the idea you have will allow the compression of a 12-megapixel image within the power limits of existing processors.

## **What is an experiment?**

An experiment is a planned activity you undertake to test your hypothesis. For software-related activities, the experiment might be, for example, the application of different iterations of proposed code solutions to a problem.

We expect you to explain how you conduct or plan to conduct your experiment. For example, you might describe the parameters you vary, those you hold constant, and those you observe or measure.

Where experiments do not yield usable results, the inputs to the experiments (such as software code or design parameters) may be varied and further experiments repeated and completed until such time that the outcome is known or able to be determined.

The activities of a failed or abandoned experiment may also be eligible if the necessary legislative criteria are met. It is understood that there is a risk of failure when conducting R&D activities.

## **Observation and evaluation**

Observation is where you observe, measure and record information and results that relate to your experiment. Such information can be qualitative (descriptive) or quantitative (numerical data).

Evaluation is where you assess and analyse the results of your experiments. You need to consider what the results of your experiment mean.

We expect your records to show that you evaluate the results of your experiment to understand why and how you achieve or do not achieve your desired outcome.

## **Leads to logical conclusions**

You need to form logical conclusions about why your results do or do not support your hypothesis. Your logical conclusion may be that you need to investigate different solutions and develop and test a new hypothesis.

## **Purpose to generate new knowledge**

You may decide to conduct R&D for several reasons. To be an eligible core R&D activity, one of your substantial purposes must be to generate new knowledge. New knowledge is taken as knowledge that did not already exist, or is not publicly available or reasonably accessible from anywhere in the world (for example, trade secret).

New knowledge can be general or applied. It may be new theoretical or practical understanding of a subject. New knowledge can be in the form of new or improved materials, products, devices, processes or services; **and/or** in the form of facts, information, skills and understanding (including about how to produce new or improved materials, products, devices, processes or services).

Generating new knowledge does not need to be the sole purpose of your activity but must be a substantial purpose for conducting the activity. An activity that only generated new knowledge by accident is unlikely to have this purpose and is unlikely to be eligible. There must be an intentional purpose to generate new knowledge; not just a by-product of normal commercial activity.

In most cases, if you are able to demonstrate that the outcome from conducting your activities could not have been known or determined in advance, those activities will have been conducted for the purpose of generating new knowledge. This is based on the assumption that new knowledge was generated by determining the outcome of your activities, which had previously been unknown.

## Software activity exclusion

Before registering any R&D activities, you need to check whether they are excluded from being core R&D activities. A list and detailed explanation of excluded activities is contained in the [Guide to Interpretation](#). Some software-related activities are excluded from being core R&D activities.

The legislation, at subsection 355-25(2) of the ITAA 1997, lists activities that cannot be core R&D activities for the R&D Tax Incentive, including:

*(h) developing, modifying or customising computer software for the dominant purpose of use by any of the following entities for their internal administration (including the internal administration of their business functions):*

- (i) the entity (the developer) for which the software is developed, modified or customised;*
- (ii) an entity \*connected with the developer;*
- (iii) an \*affiliate of the developer, or an entity of which the developer is an affiliate.*

If you conduct activities to develop, modify or customise computer software, you need first to assess if the dominant purpose of the software's use is for your internal administration.

Internal administration functions include but are not limited to:

- business applications such as payroll and accounting, invoicing, ordering, quality control reports and information management
- management information systems
- enterprise resource planning.

If the dominant purpose is for internal administration then the activities cannot be core R&D activities.

If the dominant purpose is not for internal administration, then the activities are not excluded from being core R&D activities. This may include software that:

- forms part of an electrical or mechanical device, such as industrial equipment or consumer products
- is used to collect and analyse data from experiments
- is used to provide a service to your customers.

Activities that are excluded from being core R&D activities may still qualify as supporting R&D activities. As set out below, to meet the requirements to be a supporting R&D activity, you need to demonstrate that the activity is directly related to one or more core R&D activities and also has a dominant purpose of supporting those activities.

For example, you may need to modify some of your internal administration software in order to conduct a core R&D activity to develop software that provides a service to your customers. If you were not conducting the R&D activity, you would not modify the internal administration software. As the modifications are for the dominant purpose of supporting the core R&D activity, the activity may be a supporting R&D activity, if it is also directly related to the core R&D activity.

## Supporting R&D activities

When you conduct software-related activities that meet the requirements for being core R&D activities, you may also conduct supporting R&D activities. A supporting R&D activity is one that is directly related to core R&D activities. This includes activities such as:

- setting up test beds
- coding algorithms created using existing knowledge that will be used in an experiment, or
- collating a data sample that will be used to conduct a relevant experiment.

In the circumstances that are set out below, you will need to ensure that your supporting R&D activities are conducted for the dominant purpose of supporting a core R&D activity.

### *When the dominant purpose test applies*

Activities that:

- are excluded from being core R&D activities
- produce goods or services
- are directly related to producing goods or services

must also be conducted for the dominant purpose of supporting those core R&D activities.

In any of these circumstances, you need to assess the dominant purpose of conducting the activity. Dominant purpose means your prevailing or most influential purpose. Your main purpose of conducting your activities must be to support a core R&D activity.

You may have several purposes for conducting the supporting R&D activity (for example, supporting a core R&D activity and a commercial purpose), but you can only have one dominant purpose. To determine the dominant purpose of the activity, you need to consider all the purposes you have to conduct that activity. You then need to consider the strength of each purpose and how important each is compared to your other purposes.

We expect you to document the dominant purpose of supporting R&D activities.

Please refer to the [Guide to Interpretation](#) for more information about dominant purpose.

# Section three: Claiming and evidence

## Claiming the R&D Tax Incentive

You need to apply to register within 10 months of the end of the income year in which you conduct your eligible R&D activities. Once you have registered your eligible R&D activities, you can claim for expenditure that you incurred on your eligible R&D activities through the ATO.

The ATO is responsible for the rules about what expenditure is allowed by the program. The information below will give you a general idea of what expenditure is allowed.

What you can claim will depend on your particular situation. The kinds of expenses that are more commonly seen with software-related R&D activities include:

- wages, salaries, contractor fees
- overhead expenditure
- equipment and raw materials.

You may also claim the decline in value of a tangible depreciating asset used for R&D activities.

For each item, you can only claim the proportion of expenditure and depreciation that you incurred on eligible R&D activities. You must be able to show how you worked this out if you are asked.

If you would like to know more, you should see the information on the [ATO's website](#).

There are certain expenses that cannot be claimed under the R&D Tax Incentive, with some examples being:

- 'core technology': the cost of technology that you have purchased or licensed for the purpose of developing it further is not an allowable expense. The costs associated with further developing the core technology or other technology that is required to conduct experiments may still be eligible if the relevant criteria are met (see examples on this page).
- expenditure that your company does not ultimately bear the risk of expending (e.g. expenditure on activities done to fulfil a contract where payment occurs regardless of the results).

These should be considered under the normal deduction provisions of the income tax law because you may still be able to deduct these amounts from your assessable income.

### Core technology examples:

You purchase a licence to use smart phone simulator software and you will further develop the source code to create a better smart phone simulator package. This would be core technology and the expenditure on the licence would not be eligible under the R&D Tax Incentive. This is because you will conduct activities to further develop the base simulator software code to improve the product or to develop new software services based on that simulator.

You purchase a licence to use smart phone simulator software and you want to use it to experiment with an app in a smart phone environment. The expenditure on the licence could be eligible as you do not plan to further develop or adapt the technology. You will merely use the technology to assist with your experiments.

## *If an activity or project is terminated early, can I still claim?*

Yes - you may be able to claim for any R&D activities that meet the requirements of the legislation. Completion of an activity or project is not a factor. It is not necessary for your experiments to be successful - if an experiment returns a 'negative' result, this may still be an outcome that could not be known or determined in advance and you can still have the purpose of generating new knowledge. This reflects that R&D is an inherently risky endeavour and is not always successful.

If you terminate an activity or your project after completing a supporting R&D activity, but not the core R&D activity it supports, you must be able to clearly demonstrate with records that you had an intention to conduct the relevant core R&D activity. If this intention is not evident then the supporting R&D activity may not be eligible.

## *Can I claim for R&D activities that are done overseas?*

The R&D Tax Incentive generally supports eligible R&D activities you conduct in Australia. When certain conditions are met it may also support eligible R&D activities you conduct overseas.

To [claim the R&D Tax Incentive for overseas activities](#), you must apply for and receive a positive "[Overseas Finding](#)". This application must be made before the end of the income year in which you conduct the activities. Late applications or requests for an extension of time cannot be accepted. You must also separately register the activities in your overseas finding application.

Activities conducted overseas must meet all four of the following conditions:

- your overseas activity must be an eligible R&D activity
- there must be a significant scientific link to an Australian core R&D activity
- the overseas activity must not be able to be conducted in Australia or its external territories
- the costs for overseas R&D activities must be less than the costs of related R&D activities undertaken solely in Australia.

If you do not have a positive Overseas Finding, you must be able to demonstrate that the work was carried out in Australia and not subcontracted out or otherwise performed overseas, and it otherwise meets the criteria to be an eligible R&D activity.

While the conditions for an overseas finding may have been met, you are still required to meet the conditions for claiming expenditure. Please note that where R&D activities are conducted for a related foreign resident corporation, expenses incurred on overseas R&D activities cannot be claimed irrespective of whether a positive Overseas Finding is obtained. Australian supporting R&D activities also cannot be claimed if the corresponding core R&D activity was conducted overseas.

For example, the proposed R&D activity may require access to expertise not available in Australia.

To demonstrate this, you must be able to show that you conducted a reasonable Australia-wide search and/or advertising campaign and provide evidence in the form of independent advice from research organisations, industry associations or other relevant organisations or individuals addressing the lack of available expertise and records of the advertising campaign.

## Evidence

### *What records do I need to keep?*

We expect you to keep records and be able to provide them to us if we review your application for the R&D Tax Incentive. Companies may be able to support their R&D Tax Incentive applications by providing information, documents and other material that can substantiate the facts or accuracy of their claims. Your systems and processes that identify, evaluate and record your eligible R&D activities and expenditure will form part of the evidence to support your claim. You can make use of less formal records, such as screenshots, instant messaging histories, and exported content from task tracking or project management tools.

To support a claim for the R&D Tax Incentive, we expect you to be able to provide evidence that your core and supporting R&D activities meet each and all requirements of the legislation. Records need to demonstrate more than just that you did something. They need to demonstrate that what you did and how you did it meets the requirements of the R&D Tax Incentive program. Examples of evidence that may support eligibility are set out below.

Record keeping is distinct from what you include in each year's registration. The records should relate to the point in time when the activities occurred. Companies are not expected to reiterate all records from past years in each new registration.

The department and the ATO provide further guidance on record keeping requirements:

- [R&D Tax Incentive: Record-keeping and R&D Planning](#)
- [Research and Development Tax Incentive: keeping records and calculating your notional deductions](#)

**Table 1.**  
**For core R&D activities (generating new knowledge and conducting experiments)**

Eligibility requirement	Examples of evidence
<p>The outcome of the experiments (whether the hypotheses were true or false), could not have been known or determined in advance. This requirement is assessed using the concept of a competent professional on the basis of their knowledge, networks, and information they could reasonably gain access to, and whether with this knowledge they would be able to predict the outcome of the activity in advance.</p>	<ul style="list-style-type: none"> <li>• records of literature reviews</li> <li>• communications with industry experts (emails, minutes, notes and similar)</li> <li>• screenshots of questions posted on tech blogs</li> <li>• details of failed attempts to use existing technology</li> </ul>
<p>The outcome of the activities could only be determined by applying a systematic progression of work that proceeds from hypothesis to experiment, observation and evaluation, and leads to logical conclusions.</p> <p>It is important to show that you conduct specific experiments to test your hypotheses. We expect you to keep records of experiments and their outcome at or around the time you conduct them.</p>	<ul style="list-style-type: none"> <li>• records of each step of your experimental activity, e.g. what the hypothesis was, how you tested it, the data from your experiment, how it was analysed, whether the hypothesis was proven true or false, and how these results were used to further develop existing or create any new hypotheses</li> <li>• project plans detailing how the systematic progression of work is to occur</li> <li>• code repositories or software versions with comments including weaknesses that were identified and rectified in successive versions</li> <li>• testing strategy and approach documents</li> <li>• project management documentation including plans and charts</li> </ul>
<p>Experiments are conducted for the purpose of generating new knowledge.</p>	<ul style="list-style-type: none"> <li>• minutes of board, project or team meetings where the need to conduct experiments was discussed</li> </ul>
<p>Expenditure is clearly incurred on an eligible R&amp;D activity.</p> <p>The expenditure you can claim as R&amp;D expenditure is limited to the extent it is incurred <i>on</i> R&amp;D activities. Therefore, you must show that the amounts you are claiming on your tax return have been incurred on the core and supporting R&amp;D activities you have registered with AusIndustry.</p> <p>Your records must be sufficient to verify the amount of the expenditure incurred on R&amp;D activities, the nature of the R&amp;D activities and the relationship of the expenditure to the activities.</p> <p>You must use reasonable methods to differentiate between expenditure on eligible R&amp;D activities and other activities. Where contractors are undertaking some or part of the work, you need to keep written agreements that set out the work to be undertaken, who performed the work and where it took place. If this applies to you, you should also look at <a href="#">'For whom are the R&amp;D activities conducted'</a> on the ATO website.</p>	<p>Working papers demonstrating how the R&amp;D claim was calculated, including:</p> <ul style="list-style-type: none"> <li>• exported content from task tracking or project management tools (demonstrating the actual time that staff worked on eligible activities)</li> <li>• contracts, schedules and invoices for any work, or parts of work, undertaken by contractors</li> <li>• design and scoping documents showing how purchased items were used in experiments</li> <li>• how you determined the time your utilities (excluding capital costs) were used for eligible R&amp;D activities</li> <li>• working papers demonstrating how particular items of expenditure were allocated to each of the registered core and supporting R&amp;D activities, and how the R&amp;D claim was calculated</li> </ul>

**Table 2.**  
**For supporting R&D activities (directly related to a core R&D activity)**

Eligibility requirement	Examples of evidence
<p>Supporting R&amp;D activities <i>directly related</i> to an eligible core R&amp;D activity.</p>	<ul style="list-style-type: none"> <li>• technical records showing how and why the supporting R&amp;D activity is directly related to one or more core R&amp;D activities, for example:             <ul style="list-style-type: none"> <li>– why a graphical user interface that is being claimed was necessary to conduct the experiments in a core R&amp;D activity</li> <li>– conduct technical background research</li> <li>– set up and facilitation of experiments</li> <li>– building of proof of concepts/prototypes</li> <li>– internal testing and user testing</li> </ul> </li> </ul>
<p>Where supporting R&amp;D activities:</p> <ul style="list-style-type: none"> <li>• are excluded from being core R&amp;D activities</li> <li>• produced goods or services, or</li> <li>• are directly related to producing goods or services</li> </ul> <p>the <i>dominant purpose</i> of conducting these activities must be to support a core R&amp;D activity (rather than it being for a purpose of secondary importance - to satisfy the dominant purpose test, the purpose of undertaking the activities must be the most important purpose).</p> <p>This is often a requirement where software has been developed to facilitate an experiment in an eligible core R&amp;D activity on a production line.</p> <p>You must only claim expenditure incurred on those goods or services which are used in the eligible R&amp;D activities and not for commercial production runs, and your documents should support this. Companies that sell or use the product of their eligible R&amp;D need to consider the '<a href="#">feedstock adjustment rules</a>' (which are available on the ATO website) and include the necessary feedstock adjustment amount in their income tax returns.</p>	<ul style="list-style-type: none"> <li>• where manufacturing takes place in conjunction with software-related activities, your evidence may be production run sheets and quality control sheets that identify which units were used for experiments and which were to be sold</li> <li>• where saleable goods are produced in an activity, your records need to show that you produced sufficient numbers for the experiments and not so many goods that this demonstrates a dominant commercial purpose</li> <li>• we expect you to document how that activity supports the core R&amp;D activity and satisfies the dominant purpose requirement</li> <li>• where software development occurs in a manufacturing or production environment, we also refer you to the '<a href="#">Manufacturing sector guide for the R&amp;D Tax Incentive</a>'</li> </ul>

## Section four: Case study

### Far Side – R&D in a new space



*This section of the guide provides an example case study to help you understand how to apply the requirements of the legislation to your software-related activities. This business is fictional and the case study has been developed to show the process of self-assessment and registration of software-related activities.*

## *Who they are and what they do*

Far Side produces 3D visualisations of planets, stars and other astronomical features for both educational and scientific purposes.

When a new planet is discovered, Far Side wants to create a 3D visual model of this new planet for further study. It also wants to integrate this as a new feature in its proprietary desktop software application. The company has the qualifications, knowledge and experience it needs to develop and produce visualisation software. Far Side also keeps up to date with new developments in relevant fields and consults with experts worldwide. They are competent professionals.

There are only a limited number of 3D image patches available of the new planet that the company intends to visualise. These patches represent the local geological environment of the planet. Viewers can zoom in or out for further details. When Far Side attempts to render these 3D patches, it results in visual blind spots and incomplete sections of the overall 3D model. To ensure a complete 3D render, Far Side searches worldwide for a solution to enable it to extrapolate the known 3D image patches to approximate what neighbouring patches might look like.

Far Side conducts searches of publicly available information. In particular they looked at photographic processing software, and terrain generation techniques used in gaming, both of which create graphic patches based on surrounding elements. None of the existing code or methods they identified could be extended for use with limited 3D samples extrapolated at a planetary scale.

Far Side needs the generated patches to be smoothly and continuously matched with the known patches to give a realistic representation of the entire planet. It establishes that current mathematical models do not support the available 3D data. Furthermore, after the company trials different options and methodologies it has found, it realises that the only solution is to develop new techniques to build a realistic 3D visualisation of the new planet.

The company plans a set of experiments to test hypotheses that relate to how it might generate the missing patches. For example, one hypothesis it intends to test relates to how to achieve a 3D composite, which retains the geographical features of the available 3D sample patches.

Far Side establishes that it can only determine the outcome of its activities by conducting experiments to test its hypotheses.

## *SCENARIO: Far Side thinks that it may be eligible for the R&D Tax Incentive, so it conducts a self-assessment.*

### **Is Far Side an eligible R&D entity?**

First, Far Side assesses that it is an eligible R&D entity. The company is a body corporate incorporated under Australian law. It is not an exempt entity. It meets the requirements of section 355-25 of the ITAA 1997.

### **Is their R&D eligible?**

Next, Far Side checks the requirements for eligible R&D activities and reviews its project plan to assess whether the activities it plans to conduct are eligible and meet the requirements for being R&D activities.

## Core R&D activities

Far Side considers its activities and believes that one of its activities (development of a mathematical framework to generate 3D solid patches) meets the requirements to be a core R&D activity. The company assesses that this activity meets the requirements of section 355–25 of the ITAA 1997 because:

- there is no current knowledge that can tell it how to achieve its desired outcome
- it can only determine the outcome through a systematic progression of work that is based on principles of established science and proceeds from its hypothesis
- it plans to conduct experiments to test its hypotheses about how to develop new 3D patch generation techniques
- it plans to evaluate results from its experiments to reach conclusions about its hypotheses
- it will document its activities and the conclusions reached
- its purpose is to generate new knowledge in the form of new processes and an improved software product
- its activities are not excluded core R&D activities under the software activity exclusion.

## Additional activities

After developing an effective generation module under the registered core R&D activity, Far Side considered if it could develop a faster running version. The company self-assessed that the core R&D activity as registered was at an end because it had resolved the unknown for that activity.

Far Side considered if a new core R&D activity could be registered. It self-assessed that it could use the knowledge it developed from conducting the registered R&D to optimise the speed. There was no need for experiments, nor were there unknown outcomes, as the previous knowledge equipped the internal competent professionals to confidently develop a faster version. Therefore, the company decided that this new activity would not meet the requirements to be a core R&D activity under section 355–25 of the ITAA 1997 because it can know, or determine, the outcome in advance.

## Outcome of self-assessment

Therefore, Far Side assesses that it has one core R&D activity that meets the requirements of section 355–25 of the ITAA 1997. The company applies to register *Core Activity 1 - Development of a mathematical framework for 3D patch generation*.

## Supporting R&D activities

Far Side assesses that it may also be able to register a supporting R&D activity, including project management, development of evaluation software (test environment) and obtaining data to use in the evaluation. It assesses that these tasks are directly related to Core Activity 1, and that they can occur before, during or after the core R&D activity. The company applies to register *Supporting Activity 1.1 - Project management and dynamic data integration*.

## Is Far Side's R&D expenditure eligible??

Far Side reviews ATO guidance on eligible expenditure. It registers its eligible R&D activities with the department and then lodges a claim with the ATO for eligible expenditure incurred on the R&D activities.

## Does it have evidence to support its claim??

When Far Side starts its activities, it implements a system to keep records to show that its activities meet the requirements of the R&D Tax Incentive. The company also keeps records of its eligible R&D expenditure that show the link to its eligible R&D activities.

*Far Side then use the R&D Tax Incentive portal to lodge their registration.*

## Self-assessment tool – Is my R&D Eligible?

### Is my R&D eligible?



## A look into Far Side's R&D Tax Incentive registration



*The following example of Far Side's R&D Tax Incentive portal registration form does not include all required fields. It should not be used as a guide for the description and length of response for registration of your own activities. Further guidance and resources regarding the R&DTI customer portal can be found on [business.gov.au/rdti](http://business.gov.au/rdti).*

### What are the objectives of the project

Enter a maximum of 1000 characters.

At the project level the objectives may be described fairly broadly and can include both research and development and commercial aims. Please ensure your response allows AusIndustry to understand the purposes for conducting the project.

Far Side produces 3D visualisations of planets, stars and other astronomical features for both educational and scientific purposes. The objective of this project is to add new functionality to our proprietary software application, enabling 3D visualisation of a new planet. To achieve this, we need to create new mathematical and/or statistical frameworks to extrapolate a three-dimensional (3D) sample onto a neighbouring patch of a 3D object where only a limited number of 3D image patches are available.

We plan to create the proprietary model to build a realistic 3D graphic visualisation of an entire planet surface.

### Core activity

#### Name for this core activity

If you have registered this core activity before please use the same name.

Development of a mathematical framework for 3D patch generation

## A brief description of the activity

Enter a maximum of 1000 characters.

There are a limited number of 3D image patches available of the new planet that we plan to visualise. When we attempted to render these 3D patches, it resulted in visual blind spots and incomplete sections of the overall 3D model. We looked worldwide for a solution to enable us to extrapolate the known 3D image patches to approximate what neighbouring patches might look like.

We conducted searches of publicly available information. In particular, photographic processing software, and terrain generation techniques used in gaming, both of which create graphic patches based on surrounding elements. None of the existing code or methods we identified could be extended for use with limited 3D samples extrapolated at a planetary scale.

We established that we needed to generate patches to be smoothly and continuously matched with the known patches to give a realistic representation of the entire planet. Current mathematical models do not support the available 3D data. The only solution is to develop new techniques to build a realistic 3D visualisation of the new planet. We planned a set of experiments to test hypotheses that relate to how it might generate the missing patches.

## What was the hypothesis?

Our hypothesis was that we can build a new mathematical and statistical framework for 3D patch generation to achieve a smooth and continuous graphic visualisation of an entire planet surface from a limited selection of known 3D patches.

## What new knowledge is this core activity intended to produce?

When we started this activity there was no known technique to extrapolate a known 3D sample onto a neighbouring patch of a 3D object.

The new knowledge we created in this instance is the new theoretical understanding regarding 3D extrapolation as a result of our experimentation. This gave us the information we needed to develop a new software application.

## Please explain what sources were investigated, what information was found, and why a competent professional could not have known or determined the outcome in advance.

We consulted with experts and searched worldwide. We could not find any current knowledge, information or experience to tell us how to achieve the outcome.

Current knowledge in relation to solid texture synthesis does not extend to generation using 3D geological samples. This allowed us to establish that a knowledge gap currently existed and experimentation was required to help us develop our new product. We concluded that we must conduct a systematic progression of work to determine whether we could create a model to enable 3D visualisation of the new planet.

## **What was the experiment and how did it test the hypothesis?**

We designed a set of experiments to test our hypotheses in which we built and tested a series of new models employing new 3D generation techniques. The experiments investigated the effects of different technical variables in each iteration of the model.

For example, in relation to the effect of new mathematical models on the relationship of real image patches to extrapolated samples, we developed iterations of proposed code solutions to compare the continuity for the sample and generated patches, and the level of realism of the resulting visualisation.

Experimentation on benchmark datasets demonstrated our method significantly outperforms commonly known methods. This involved developing sample test sets, setting up the test environment and conducting the experiments. The experiments were designed to be reproducible.

For each set of experiments, we were able to describe the parameters varied, those held constant, and those observed or measured.

## **How did you evaluate or plan to evaluate results from your experiment?**

We used images of known geological features of a nearby object (the Moon) to validate our results and evaluate the accuracy of extrapolation. In relation to the quality of the output, particularly around the edges of the known 3D samples, we were able to reach logical conclusions about any resulting mismatches between real and extrapolated images.

We applied known methodologies to evaluate how realistically the new code implementations rendered the planet surface within acceptable response times. In other words, we employed known techniques to conduct our experiments. As such, we assessed that this testing formed part of a systematic progression of work that proceeded from our hypothesis. We noted that performance testing on its own would likely not meet the requirements of the R&D Tax Incentive. This is because experts could have predicted the outcome of this testing and achieved that outcome through existing techniques.

## **Describe those conclusions.**

Through our experiments, we were able to develop the new mathematical and statistical framework for 3D patch generation as hypothesised.

In relation to the quality of the output, particularly around the edges of the known 3D samples, we were able to reach logical conclusions about any resulting mismatches between real and extrapolated images.

## **Supporting activity**

### **Name for this activity**

Project management and dynamic data integration

### **Briefly describe this supporting activity**

Literature and patent searches and discussions with experts to assist us with developing our hypotheses, development of evaluation software (test environment) and managing and recording results.

### **How did this activity directly support the core activities?**

After we developed the mathematical and statistical frameworks for our new 3D image generation method, we needed to obtain 3D planetary image samples from an external data source.

### **Did this activity produce a good or a service, or is it directly related to producing a good or a service?**

- Yes
- No

After developing an effective generation module under the registered core R&D activity, Far Side considered if it could develop a faster running version. The company self-assessed that the core R&D activity as registered was at an end because it had resolved the unknown for that activity.

Far Side considered if a new core R&D activity could be registered. It self-assessed that it could use the knowledge it developed from conducting the registered R&D to optimise the speed. There was no need for experiments, nor were there unknown outcomes, as the previous knowledge equipped the internal competent professionals to confidently develop a faster version. Therefore, the company decided that this new activity would not meet the requirements to be a core R&D activity under section 355-25 of the ITAA 1997 because it could know, or determine, the outcome in advance.

# Getting more information

- Contact the department via telephone on 13 28 46 or visit [Business.gov.au/contact-us](https://Business.gov.au/contact-us).
- For assistance with claiming expenditure for R&D activities, visit [ato.gov.au](https://ato.gov.au).
- [Subscribe to the R&D Tax Incentive Information Bulletin](#) and receive updates on guidance, taxpayer alerts, program trends, and topical news.
- Attend an R&D Tax Incentive information session to learn more about the R&D Tax Incentive and how to apply. [Register to attend or be notified about an upcoming information session](#) for businesses and tax agents.
- Read the legislation. This guide is an overview intended to help you more easily and quickly determine your eligibility. This guide does not cover every situation and is limited to general advice only.
  - You must always assess your activities against the criteria in the legislation. The definition of 'R&D activities' is contained in the R&D section (Division 355) of the [Income Tax Assessment Act 1997](#).
  - The law that sets out the conditions for overseas activities is in the [Industry Research and Development Act 1986](#).
- The Commonwealth disclaims all liability for any loss or damage arising from you or anyone else erroneously relying on this guide or any statement contained in it.
- It is ultimately your responsibility to seek and obtain your own advice about the eligibility of your activities for the R&D Tax Incentive.