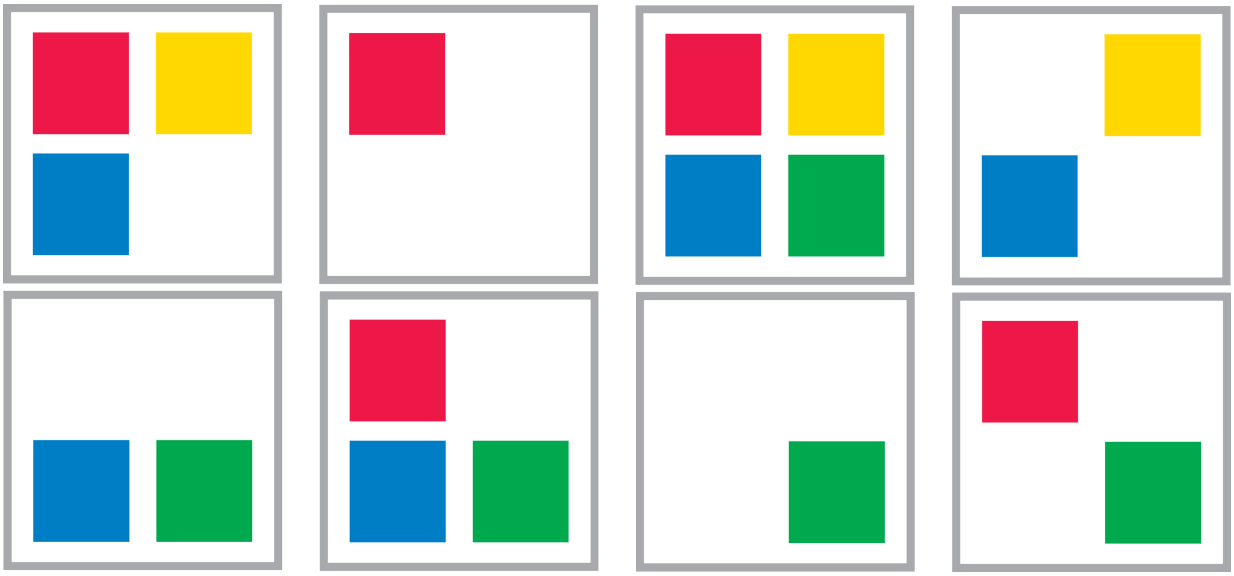
The Techie Guide to Google Website Optimizer

v 1.0



Google™ Website Optimizer

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Forward

Welcome to The Techie Guide for Google Website Optimizer™ (GWO) This guide will help you integrate GWO into any website and test almost anything.

You'll find detailed technical information on what GWO does and how it works. We'll cover integration issues ("Where exactly do I put the GWO code?") and setup issues ("How do I create an experiment using a non-standard setup?"). We'll show you how to launch simple experiments and full-on hairy scenarios.

We'll also look behind the scenes at an experiment in operation. You'll see how the elements you install actually work when the experiment is launched.

By the end of this guide you should have enough information so that the only thing limiting your testing is your imagination.

Prerequisites

This is a technical guide. We assume that you, dear reader:

- Know how to edit HTML files
- Have a basic understanding of JavaScript
- Understand how cookies work

The more advanced stuff also requires experience with server side programming like PHP or ASP.

When giving examples, we'll refer to the site you're testing as www.mysite.com.

We may, at whim, abbreviate Google Website Optimizer as GWO and Google Analytics as GA. We will also, at times, abbreviate multivariate testing as MVT and A/B testing as simply A/B.

Future Compatibility

Though this guide provides "inside" information on how GWO works, Website Optimizer is an evolving product. Information in this document may become stale in the future, and experiment designs using this information may not work as intended after some future date. This does not mean that certain types of experiments will become impossible in the future, only that some assumptions will no longer hold true, and that there will be different ways to achieve the same ends.

We should emphasize here that deviating from the "out of the box" methods for creating experiments should always involve testing a technique and previewing pages to ensure a good user experience.

Updates and Revisions

The Techie Guide is a living document. We intend to update both it and GWO with the latest tricks from our engineers and the Website Optimizer community. You can always find the latest version of the Techie Guide at www.google.com/websiteoptimizer/techieguide.

How Experiments Work

This chapter will show you how experiments work, with notes on page loads, JavaScript, cookies, and more. We'll describe what happens when a website visitor hits:

- The test page for A/B
- The test page for MVT
- The conversion page

Let's start with a simplified overview of what Google Website Optimizer does.

Suppose you have a website at http://www.mysite.com/landing_page.html, and you want to answer the question, "What changes could I make to this page to make it perform better?" You might consider changing the headline, the copy, or the call-to-action buttons. You might want to try a different image (Which picture drives more conversions, puppies or kittens?). Or perhaps, you want to try a completely different layout and page structure. Website Optimizer lets you try these different variations and see which performs most effectively.

Note that while, GWO allows you to test several pages or extended portions of your website, not just single pages, for the purposes of this explanation we'll assume that you're testing just a single page of your site.

Website Optimizer offers two types of experiments for your testing pleasure:

A/B experiments test involve testing one page against one or more alternate pages. Each version of the page has its own URL. For example:

- http://www.mysite.com/landing_page.html (Version A, also known as the original or control)
- http://www.mysite.com/test_page_b.html (Version B)
- http://www.mysite.com/test_page_c.html (Version C)

And so on, with as many test versions as you like

With an A/B experiment you are testing two completely separate pages. So you could design a page with an entirely different layout, navigation. You can also test smaller changes like new copy, headlines, and images.

Multivariate (**MVT**) experiments test different versions of content *within* a page.

With an MVT experiment, all your visitors would go to http://www.mysite.com/landing_page.html, but they would see various combinations of the three elements you're testing. The sections of the page are altered dynamically as the browser displays the page to the user.

Side Discussion

At first glance it may seem like A/B is always the simpler choice, but this isn't necessarily the case. Here are three reasons why:

1. Just running an experiment introduces a small amount of latency by requiring JavaScript (siteopt.js -- more about this later) to be fetched. A/B redirection introduces more latency in that a new page needs to be fetched. MVT does not have this problem.
2. A/B involves more than one URL, thanks to the redirects to versions B and C. That adds more chances for error. For example, the alternative URLs may not be in the same domain as the original URL, or pages may have multiple URLs aliased to them
3. Query parameters are merged when redirection occurs. Making assumptions about which parameters are found where can lead to mistakes.

Don't be scared off of doing A/B experiments by any means. Just don't assume they're always the easiest choice, either.

Depending on how you set up your experiment, each visitor could see one of a dozen or more combinations of the headline, image, and call-to-action button on that page.

In other words, one would see the puppy image with headline A and call-to-action button B. Another would see the kitten image with headline C and call-to-action button A. And so on.

Let's take a closer look at an MVT experiment in action, continuing the three-section experiment we described above. Here's the sequence of events:

1. A visitor lands on your test page: http://www.mysite.com/landing_page.html.
2. The GWO Control Script (which is JavaScript code) executes, which generates a request to the GWO servers to request an additional JavaScript known as *siteopt.js*.
3. If this is the first time the user has seen this experiment, siteopt.js sets cookies to note what variation of the page the user has seen, and it sets up variables and defines the utmx_section function so that later in the page, as the document is parsing and executing, the code there will make use of the variables to replace the section content.

   If this is not first time the user as seen the experiment, then siteopt.js will read the previously created cookies. It will then define the utmx_section function such that later in the page the user will see the same variation they saw when they last saw the experiment. Additionally, the cookie expiration date will be reset to two years.

   Points to remember

   - siteopt.js is not a static file. It is generated dynamically based on the values passed to it and on the specifics of your experiment.
   - The Control Script also checks to see if the page is using HTTP or HTTPS. If the page is using HTTPS, it will make a secure request for the siteopt.js file.
4. A third piece of code, which we call the Section Script, determines which section variations will appear to users. As the browser parses the page, it will encounter Section Scripts, which can modify the original content. It calls utmx_section function that was defined by siteopt.js earlier in the page.
5. The Section Script works with siteopt.js to replace the original version of the content with an alternate version that includes alternate headline B, a kitten image, and call-to-action button C. Some users, chosen at random, will see the original version of the page as a control. In this case, the Section Script will leave the original content in the page unchanged.
6. The Tracking Script on the test page uses the cookies set by siteopt.js to note which combination of content was displayed to the user. The Tracking Scripts submits this information to GWO for the purpose of reporting.
7. If the user (we hope) then visits your conversion page, such as http://www.mysite.com/thank_you.html. The GWO Conversion Script, which is nearly identical to the Tracking Script, records the visit to the conversion page, thank_you.html, and adds one more conversion to the total for the B-kitten-C combination this visitor saw.

   Note that the Conversion Script will record the conversion only if the user first came through the test page, executing the Control Script and the Tracking Script. Visitors who happen to reach the conversion page through some other route won't be counted as conversions.

   Points to remember:

   - Any individual visitor will be counted only once for visits and conversions on a given test, no matter how many times he or she visits the test or conversion page. This makes each test an "apples to apples" comparison of first-time visitors.
   - GWO cookies have a lifetime of two years. A conversion must happen within two years of the visit to the test page to be counted. (And if you finally get your conversion 23 months after first contact with the customer, congratulations!)

A/B Experiments

For A/B tests, the sequence is almost the same. But instead of GWO replacing pieces of the page content dynamically, it redirects the visitor to one of the prepared test pages.

The Control Script for an A/B experiment is nearly identical to that of a multivariate experiment. It contains an extra script that when executed calls the utmx function. The utmx function will either not do anything (if the user is to see the original) or *redirect* the user to the B or C pages.

Detailed Explanation of MVT Experiments

Now let's take a more technical look at what happens for MVT experiments:

1. The visitor's browser makes a request for http://www.mysite.com/landing_page.html
2. The contents of landing_page.html are loaded into the browser. (Technically the page is streamed to the browser and the parser won't see the whole page until after all the data has been streamed in and the inline scripts executed).
3. The GWO Control Script (at the top of the page) executes.
4. The Control Script looks for a GWO cookie. This is to see if the user has visited the page before.
5. The Control Script makes a request from Google's servers for an additional script, siteopt.js, appending the experiment key and GWO cookie values, like this:

   ```
   http://www.google-analytics.com/siteopt.js?v=1&utmxkey=<experiment
   key>&utmx=<__utmx cookie value>&utmxx=<__utmxx cookie
   value>&utmxtime=<request timestamp>
   ```

If this *is* the visitor's first visit to the page:

- The utmx and utmxx values passed to siteopt.js will be empty.
- A combination will be randomly chosen for the visitor
- siteopt.js will set the __utmx and __utmxx cookies.

If this *is not* the visitor's first visit to the page:

- The utmx and utmxx values passed to siteopt.js will have the values that were previously set.
- The combination chosen for the visitor will be based on the utmx value.
- The GWO cookie's two-year expiration date is reset.

siteopt.js includes the code that defines the utmx_section function. This is the function that actually replaces the content on the page.

The utmx_section functions are executed, which replace the content for each section. The content to be replaced comes from whatever was entered when the experiment was set up.

If the section content to be shown is the original version of the content, GWO will do nothing to that section. The user will simply be shown the original section content. If you modify the content on your original page after the test begins, users will then see whatever changes are made.

The visit tracking code runs, which tracks a visit and the combination seen. This is basically a standard Google Analytics (GA) tracking call, using a custom "virtual URL" representing a visit to the test page.

The virtual URL looks like this: "/<experiment key>/**test**" where the experiment key is the same as the k variable in the Control Script like `var k='2045836535'`.

Know your cookies

Here's a detailed explanation of the parameters in the GWO cookie:

v The version of the control code making the signup request to siteopt.js. The v value is hard coded in the Control Script on the test page.

utmxkey The unique identifier for the experiment. This 0-padded 10-digit decimal value is read from the k variable in the Control Script (var k='1234567890').

utmx The value of the ___utmx cookie that GWO uses. It tracks what combinations a visitor has seen for zero or more experiments. For example:

```
123456.01234567890123456789:1:1-3-2.98765432109876543210:3:3-1
```

This example illustrates information for two experiments. The first part (123456 in this example) is the domain hash, identical to that found in the Analytics cookies (__utma, for example). Then comes information for experiments, each one separated by at dot. For each experiment, there is a three-part, colon separated string. The first part is the Experiment ID and Experiment Key represented by a 20 digit number. The Experiment Key represents a family of experiments. Experiment ID uniquely identifies an experiment, regardless of the family. The second part is for GWO internal purposes. The third is the combination that the visitor is to see for the given experiment. It is of the form of components separated by dashes where each component represents the variation chosen for the visitor to see for a given section. The number of components is equals to the number of sections defined by the experiment. In the above example, there are two experiments represented. In the first, the visitor is to see combination 1-3-2 and in the second experiment, the visitor is to see combination 3-1.

It's important to note that information about multiple experiments can be encoded in the utmx cookie.

utmxx This is the value of the __utmxx cookie that GWO uses. This variable is reserved for future use.

utmxtime A simple Unix-based time stamp for the request. This is added so the request will not be cached.

Detailed Explanation for A/B Experiments

Now let's take the same technical look at what happens for A/B experiments:

1. The visitor's browser makes a request for http://www.mysite.com/landing_page.html
2. The contents of landing_page.html are loaded into the browser.
3. The GWO Control Script (at the top of the page) executes.
4. The Control Script looks for a GWO cookie. This is to see if the user has visited the page before.
5. The Control Script makes a request from Google's servers for an additional script, siteopt.js, and appends the experiment key and GWO cookie values as such:

```
http://www.google-analytics.com/siteopt.js?v=1&utmxkey=<experiment
key>&utmx=<__utmx cookie value>&utmxx=<__utmxx cookie
value>&utmxtime=<request timestamp>
```

6. The visit tracking code runs, which tracks a visit and the page version. This is basically a standard Google Analytics (GA) tracking call, using a custom "virtual URL" representing a visit to the test page.
7. The virtual URL looks like this: `/<experiment key>/test` where the experiment key is the same as the k variable in the Control Script like `var k='1234567890'`.

Points to remember

- The parameters for A/B experiments are the same as for multivariate experiments, with this exception: The value of "utmx" applies to each single experiment page, rather than to several sections of each page.
- If the visitor was chosen to get the original version of the test page, GWO will do nothing (not redirect).

The Conversion Page

When your visitor reaches the conversion page:

1. The Conversion Script runs, which tracks a conversion and the combo version (for MVT) or page version (for A/B).
2. Like the Tracking Script, this is basically a standard Google Analytics (GA) tracking call, using a custom "virtual URL" representing a visit to the test page.

   The virtual URL looks like this: `/<experiment key>/goal` where the experiment key is the same as the k variable in the Control Script such as `var k='2045836535'`.
3. When the GA call is made, the value for the __utmx cookie is passed to Google's servers. If the user **has** an __utmx cookie (which matches the experiment ID), GWO uses the value from the cookie to know which combination or page to attribute the conversion to.

Know your cookies

GWO uses cookies (and only cookies) to identify unique visitors. Each unique visitor will be counted only as a single visitor -- and if they convert, only as a single conversion -- regardless of how many times they visit the test page or conversion page. The cookie lifetime is two years.

For more details on our Tracking Scripts, please see the GA technical documentation at: http://code.google.com/apis/analytics/docs/gaConceptsOverview.html#trackingCodeExecution.

Setting Up Experiments

Background

Now that we see how GWO actually works down in the boiler room, let's set up an experiment.

Section one, **Standard Experiments**, covers the simple scenario of a single test page and a single conversion page on a single server.

In this scenario the content you want to test is static (though the page itself might be generated dynamically with PHP or ASP.NET).

Section two, **Non-Standard Experiments,** covers more advanced scenarios for testing static content, such as:

- Dealing with development and production servers
- Dealing with pages that are not directly accessible (like those requiring a user to log in)

We won't cover every single possible scenario, but the explanations you'll find here should give you enough information to integrate GWO into your own specific environment.

In section two, we're still assuming the content you want to test is static, but in section three, **Experiments with Dynamic Content**, we explain what to do when the content you want to test has dynamic elements. This might include, for example, testing a product detail page with variations on the product-specific information.

Standard Experiments

Here's a jolly step-by-step example for setting up a simple experiment.

This example is kept simple on purpose. In later sections we'll dig deeper into what GWO does in each step of the setup process, and talk about how to rig up more advanced scenarios.

Setting up an MVT experiment

Let's say you're testing a lead sign-up form (found at http://www.mysite.com/sign-up.html) and your conversion page is http://www.mysite.com/thank-you.html.

Let's also say you want to test two parts of the page:

- The headline
- The call-to-action text in the submit button

Step 1: Set up test and goal pages

- Name your experiment. For example: Sign-up Form Test
- Set your test page URL: http://www.mysite.com/sign-up.html
- Set your conversion page: http://www.mysite.com/thank-you.html

At this point GWO will try to retrieve the pages from your website to make sure the URLs are valid.

Step 2: Install and validate JavaScript tags

On your test page:

- Add the Control Script at the top of the page
- Add Section Script tags for the sections you want to test (in this example, the headline and the submit button text)
- Add the Tracking Script at the bottom of the page

On your conversion page:

- Add the Conversion Script

At this point GWO will try to retrieve the pages from your website in order to:

- Validate the Control Script on the test page
- Validate the Tracking Script on the test page
- Search for Section Scripts to understand what sections are on the page
- Validate the Conversion Script on the conversion page

Step 3: Create variations

- Create the alternate versions of the content you want to test. (In this example, one or more alternate headlines and one or more versions of the submit button text.)

Step 4: Review and launch

Review the data, test the page using the 'preview' function, and then launch your test!

Experimenting with only a percentage of traffic

You can show the experiment to only a percentage of the traffic to your site if you like. For instance, you might decide that you only want 10% of your traffic to see the test.

Note that even though you may include only a certain percentage (such as 10%) of visitors in the test, all visitors will trigger the script. The only way the system knows how to include 10% of visitors is to be measure the arrival of everyone who visits the page.

Setting up an A/B Experiment

Let's say you want to test two variations for the layout of the sign-up page.

Step 1: Name your experiment and identify pages

- Name your experiment. For example: Sign-up Form AB Test
- Set your original test page URL: http://www.mysite.com/sign-up.html
- Set your first variation test page URL: http://www.mysite.com/sign-up-b.html
- Set your (optional) second variation test page URL: http://www.mysite.com/sign-up-c.html
- Set your conversion page URL: http://www.mysite.com/thank-you.html

At this point GWO will try to retrieve these pages from your website to make sure the URLs are valid.

Step 2: Install and validate JavaScript tags

Original test page:

- Add the Control Script at the top of the page.
- Add the Tracking Script at the bottom of the page

First variation test page:

- Add the Tracking Script at the bottom of the page

Second variation test page:

- Add the Tracking Script at the bottom of the page

Conversion page:

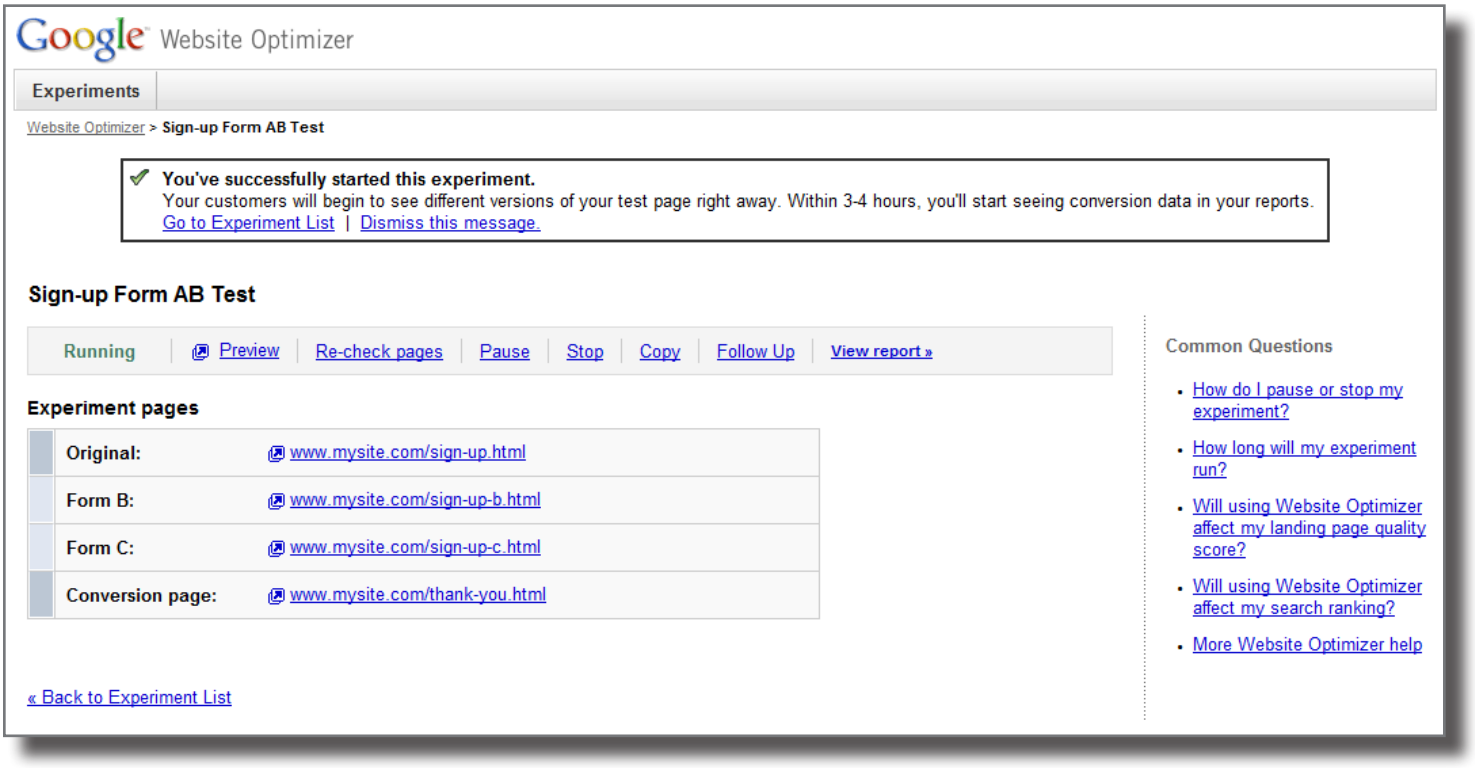
- Add the Conversion Script

At this point GWO will try to retrieve these pages in order to:

- Validate the Control Script on the original test page
- Validate the Tracking Script on the original and variation test pages
- Validate the Conversion Script on the conversion page

Step 3: A/B experiment set-up: Preview and start experiment

- Review the data, test the pages using the 'preview' function, and then launch your test!



A/B Experiment Launched!

Non-Standard Experiments (Testing Static Content)

Background

Before we go into the specifics of setting up experiments for non-standard setups, let's elaborate on some GWO concepts.

Earlier in this guide, we used the terms *test page* and *conversion page* (in singular form) to keep things simple. As you set up an experiment, GWO asks for the URL for your test page (or pages, for A/B experiments) and the URL for your conversion page. GWO then continues to explain how to install the JavaScript code on the test page and the conversion page.

These terms imply that your test elements are all part of a single test page with a specific URL, and that conversions happen on a specific URL.

But what if this isn't the case?

Let's look at how to set up more complicated scenarios. As we saw earlier, GWO has four pieces of JavaScript (three for A/B):

1. The Control Script at the top of the page (this loads the JavaScript functions used to replace content for MVT or redirect the user for A/B)
2. The Section Script (utmx_section) right before a section with a </noscript> at the end (for MVT only)
3. The Tracking Script JavaScript
4. The Conversion Script JavaScript

This time, instead of thinking in terms of a test page and conversion page with specific URLs, think in terms of executing some JavaScript for each one of the functions.

- To load the utmx section function, call the Control Script, which then invokes siteopt.js, which will provide an implementation of the utmx section function.
- To replace the content for a section, call the Section Script. This applies to MVT experiments only. The utmx_section alone is not capable of completing this work. You need an ending </noscript> tab to delineate where the section ends.
- To register a visit, call the Tracking Script.
- To register a conversion, call the Conversion Script.

Here are a few other details you should know:

Purpose of utmx_section

The utmx_section function call just before a section, and the </noscript> at the end of a section, are actually serving two different purposes.

1. When the function is executed, it marks where the section begins and ends (denoted by </noscript>), and it may replace the content. When a user is viewing the original content, it leaves anything between those tags untouched.
2. When the experiment is being set up, GWO looks for the utmx_section call to identify the names and order of the sections.

Original versions of content

When the original version of the content is displayed, GWO does NOT make any modification to the content in the section. The only place that the original content exists (for the purposes of displaying to end users) is in the page itself. If you make any changes to the original content on the page that's what visitors will see when they are chosen to see the original. Keep in mind that changing content in the middle of an experiment will screw up the stats for the original and effectively invalidate the experiment as a whole. So, you probably don't want to do that.

In other words, if you set up an experiment with this code:

```
<script>utmx_function("headline")</script>

<h2>Buy Acme Widgets at 50% Off!</h2>

</noscript>
```

...and then after setting up the experiment, changed the code on your page to this:

```
<script>utmx_function("headline")</script>

<h2>Acme Widgets - Buy One Get One Free.</h2>

</noscript>
```

The content that would now be displayed for the original version is:

Acme Widgets - Buy One Get One Free.

Now that we better understand what the setup process does, let's look at some common scenarios that don't fit the simpler setup scenario:

- Development & production servers that have different URLs (usually just the domain name: http://dev.mysite.com and http://www.mysite.com)
- Pages that aren't directly accessible by GWO (pages behind a firewall, pages that require a username and password, or pages that use the same URL but display differently)
- Multiple "pages" that share the same page name but use parameters to display different content (such as product_page.php?pid=5 and product_page.php?pid=6)

Setting up Multivariate Tests

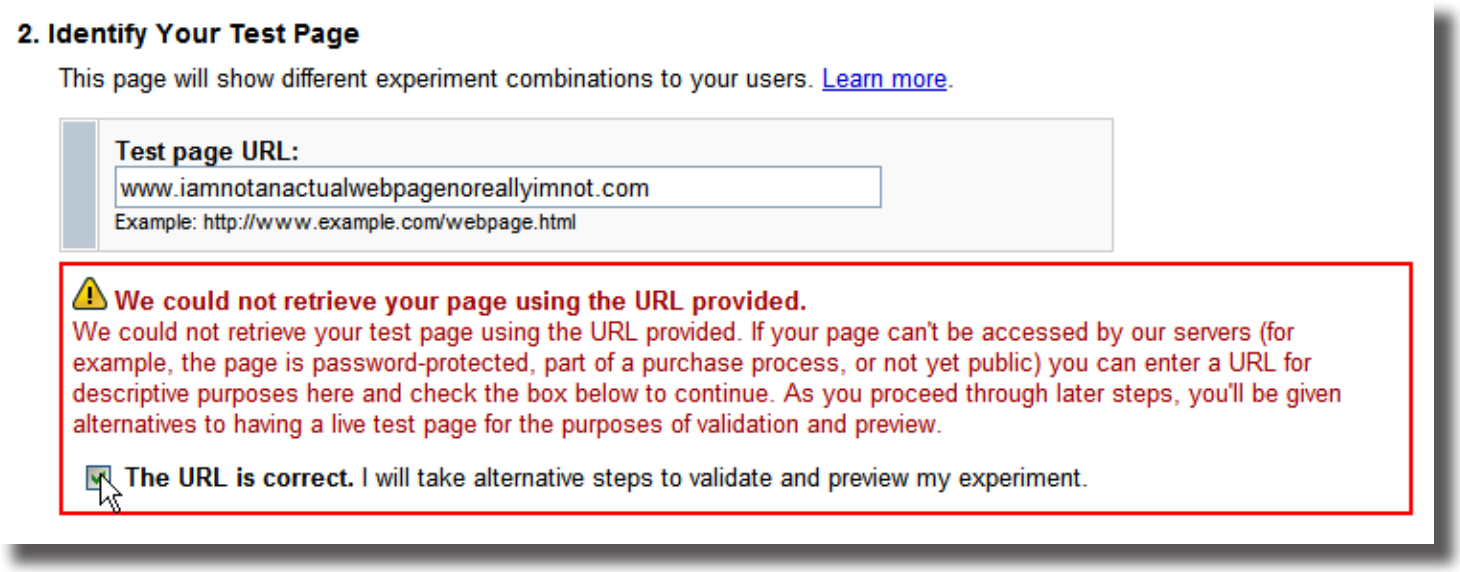
Step 1: Set up test and goal pages

Experiment name is used only within your GWO account. You'll see it on the list of experiments in your account, but visitors to your website won't see it.

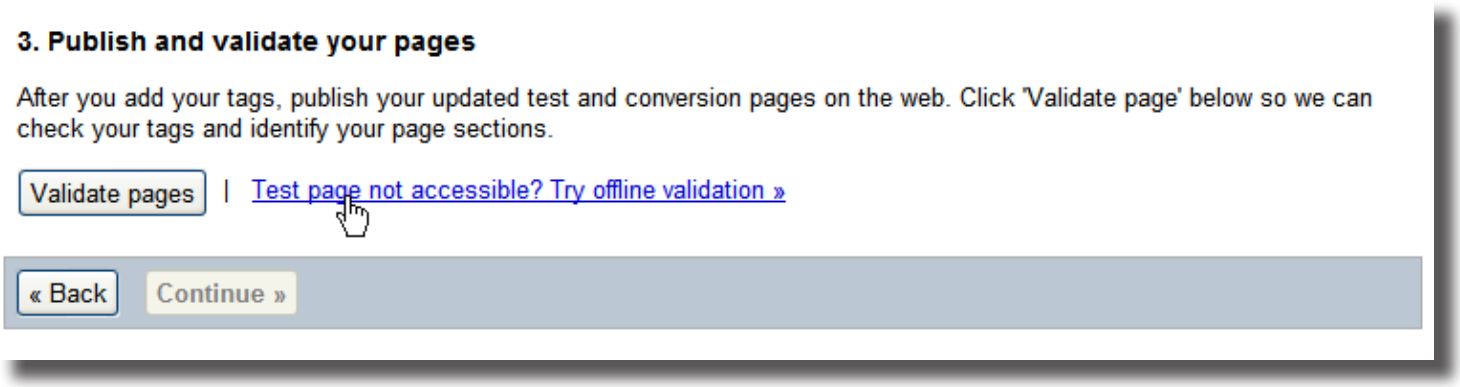
Test page URL is used only during the setup process and for the preview function. After you're done setting up your experiment, Website Optimizer won't use this URL in any way other than to show a preview within GWO -- for example, when you preview how a combination or variation looks by clicking the combination on the report page. If you plan to upload pages manually, then this field won't matter.

How Website Optimizer uses the Test page URL:

- In Step 1, GWO will make a request to this URL to confirm that the page exists. If this URL isn't live yet, check the box reading 'The URL is correct' to continue on to the next step.



- In Step 2, GWO will try to load the page found at this URL, looking for the page sections to be tested. If there is nothing at this URL, or if there is the page exists but doesn't include the valid Section Scripts, try using offline validation.



- Also in Step 2, GWO will look for the Tracking Script at this URL. If there is nothing at this URL, or if there is something but it doesn't include the valid GWO code, you can just use the offline validation as above.
- For previews, GWO uses this URL to load the page in the preview frame. Pages can also be previewed using a URL different than the one you entered here. We'll show you how to do that later.

Conversion page URL is used *only* during the setup process. After you're done setting up the experiment, GWO doesn't use this URL in any way. If you'll be uploading the pages manually, you can enter whatever you like here. The field can't be left blank, however, so feel free to enter whatever URL you'd like here.

How Website Optimizer uses the Conversion page URL:

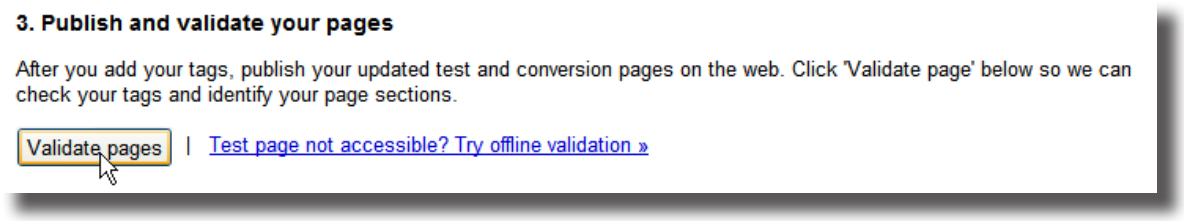
- In Step 1: GWO will make a request to this URL, just to see if something is there. If not, click the checkbox provided to continue to Step 2.
- In Step 2: GWO will look for the Conversion Script at this URL. If it alerts you that it can't find valid GWO code, use the offline validation instead.

Step 2: Install and validate JavaScript tags

In Step 2, GWO asks you to add the JavaScript code to the appropriate pages or sections of your site. The system will then:

- Try to validate that you correctly copied the Control Script, Tracking Script and Conversion Scripts.
- Look for parts of the page tagged with Section Script.

Click **Validate** pages and GWO will try to download the files from the URLs provided.



To use your own files for validation, use this option: **Test page not accessible? Try offline validation »**

The question you may ask now is: "What files do I upload and where do I put the tags if I'm uploading my own files for validation?"

For the **test page**, we recommend:

1. Add the tags in the right places so you can see them using the browser's "view source" on your local machine.
2. Use a web browser to view the page you want to test locally on your computer (such as http://dev.mysite.com/product.php?id=50)
3. Save the HTML source of the page to a local static file (product_php.html)
4. Edit that saved file (product_php.html) by adding the right tags in the right places

Notes from a GWO tester:

"For the test page, you can technically create a page that contains nothing but the Control Script, the test page Tracking Script, and the appropriate sections with nothing in them. Something like this:

```
{Control Script}

<script>utmx_section("headline")</script>
</noscript>

<script>utmx_section("product image")</script>
</noscript>

<script>utmx_section("call to action button")</script>
</noscript>

{test page Tracking Script}
```

While this will work fine from a technical perspective, I find that by using the actual HTML output from the test page, it forces me identify the start and end of each section in the page, which I'll have to do in any case and should have done before setting up the experiment. It's also helpful to see the correct version of the original content within the GWO interface."

For the **conversion page**, locally create a dummy file (such as conversion_dummy_file.html) containing nothing but the Conversion Script. This is especially helpful if the conversion page requires a purchase and is hard to view without making an actual purchase. In any case, you'll need to add the Conversion Script to the real conversion page before you launch the experiment.

Step 3: Create variations

Once you've reached Step 3, creating variations is the same as in the simple scenario. If your variations contain dynamic content, you can see how to set that up in the next section.

Step 4: Review and launch

This step should really be called "Review, **preview** and launch".

While GWO used your own local files to help during the experiment setup stage, by this point you should have all the GWO code in place so it appears in the HTML source on an actual web server. If you have access to the test page from your own PC (for instance, on a development server that is not publicly accessible), the preview function will work fine. The preview function calls the page based on the URL you provided in Step 1, and adds a string that looks like a local anchor (starting with #).

For example, to preview: http://dev.mysite.com/product_page.php?pid=123

GWO will use a URL that looks like this:

```
http://dev.mysite.com/product_page.php?pid=123#utmxid=EAAAACmLHKpzyPXnHnp
og9gHi14;utmxpreview=0-0-0;utmxreload=1
```

Experiment ID is an alpha numeric sequence (`AgAAAIuElaplZk1wAusMbP0ZUYo`, for example). To find this ID, open the Website Optimizer preview page for your experiment; the value of the query parameter experiment is the experiment ID.

Combination is the combination you want to preview. It is a sequence of numbers, separated by dashes. Each number represents a page section in your experiment, and the value of each number identifies the variation. For example, if your experiment has three sections, the combination **2-0-1** specifies the second variation of the first section, the original of the second section, and the first variation of the third section. Variation order is determined by the order of the Section Scripts on the test page. To see the original combination for an experiment with four sections, you would specify **0-0-0-0**.

For example:

```
http://www.mysite.com/product_page#utmxid=EAAAAOYh8q79WlRUYLWrG7ax48I;utm
xpreview=0-2-0
```

Once you've appended the preview string to your test page URL, you'll need to force a refresh to get the browser to fetch the requested variation. This can usually be achieved by hitting CTRL+F5 in the browser. (The forced refresh is necessary because the specified combination appears after a '#' symbol and is not considered part of the cacheable URL.)

If the test page is not directly accessible within the GWO preview, you can copy and paste the "preview string" and append it to the live page. Let's say you set up the experiment on a dev server and provided URLs for the dev server during the experiment setup, then copied the GWO code to the live server. In that case, before launching the experiment you can copy the files to the production server and then replace the preview URLs with ones for production.

For example, if the page is: `http://dev.mysite.com/product_page.php?pid=123`

...and the preview URL looks like this:

```
http://dev.mysite.com/product_page.php?pid=123#utmxid=EAAAACmLHKpzyPXnHnpog9gHi14;utmxpreview=0-0-0;utmxreload=1
```

You can just switch the domain name to test it in production:

```
http://www.mysite.com/product_page.php?pid=123#utmxid=EAAAACmLHKpzyPXnHnpog9gHi14;utmxpreview=0-0-0;utmxreload=1
```

Once you're happy with the preview in production, you can just launch the experiment, and then test the pages in production (without the preview string, of course). `http://www.mysite.com/product_page.php?pid=123`

Previewing Inaccessible Pages

In some circumstances, you won't be able to use the preview feature to view your test page combinations. For example, if your test page is password protected, part of a checkout process, or session-specific, Website Optimizer may not be able to access your test page for previewing.

However, you can still preview your page manually. Launch your browser and navigate to your test page, taking whatever steps are required to get to your actual test page URL (such as entering a password or going through a checkout process).

Once you're viewing the test page, you can modify the URL in the browser's address field to view a specific combination. Append the following string to the test page URL: `#utmxid=Experiment_ID;utmxpreview=Combination`.

Most browsers won't reload a page if the only difference in the URL is the anchor string. Here's an example:

If you visit a page with this URL: http://www.mysite.com/page.html#string_a

...and then go to a URL where the only difference is the anchor string, like this: http://www.mysite.com/page.html#string_b

...the browser won't try to load the page from the server, but will use the local cached version. This means you might not see the correct version in the preview.

The solution is to simply force a reload of the page after you've updated the URL. To do so, hit CTRL+F5. This works on all major browsers on the PC. On a Mac, hit *Command + Shift + R.*

Experiments with Dynamic Content

Background

It's a common question: "How do I deal with experiments where the section I want to test includes dynamic content?"

Suppose you want to test three sections on a product detail page:

- Product name (testing a short name vs. long name)
- Product image (testing large vs. small)
- Call-to-action button (testing "Add to Cart" vs. "Buy Now")

At first glance, this seems to be a prime candidate for a MVT experiment. But when setting up the experiment you realize to your horror that there's no way to enter dynamic data into any of the sections. What's the solution?

There are actually two ways to tackle this:

Option 1 - Use a MVT experiment and custom JavaScript

Pros:

- This is a true MVT experiment.
- Does not require a redirect
- Works well if you're comfortable with advanced JavaScript.

Cons:

- Requires an additional layer of JavaScript to display the content, which could potentially get very complex and difficult to debug.
- Requires additional code to support users who have JavaScript disabled.

Option 2: Use an A/B experiment

Set up the experiment as an A/B experiment, regardless of what you're testing. Since the GWO server does not return dynamic content any dynamic content has to come from the your own web server.

There are two ways to implement this using an A/B experiment, which we'll cover in a moment, but the underlying idea is the same.

Pros:

- Simple to implement
- Works for everyone (even if they have JavaScript off).
- Works well if you're not a JavaScript guru.

Cons:

- You'll need to manually create a separate version of the page for each combination.
- Requires a redirect.

Let's dig into the details.

Option 1 - Use a MVT experiment and custom JavaScript

Here is a proof of concept example that uses an MVT style of experiment to test sections with dynamic content. Suppose you have a section in which there are three pieces of dynamic content. Then, consider an alternative section variation for this section:

> **Point to remember**
>
> There is no "best" solution for implementing experiments with dynamic content. Each has its pros and cons. Some developers will prefer option 1 and others will stick with option 2

```
Buy a %%product_name%% for the price
of %%product_price%% by <a href='buy.php?prod-id=%%product_id%%'>clicking
here</a>
```

Tokens (such as `%%product_id%%`) are to be replaced with dynamically generated content. When creating your alternate versions, you might want to try:

```
For the price of only %%product_price%%, you can buy a %%product_name%%
by <a href='buy.php?prod-id=%%product_id%%'>clicking here</a>
```

Note that the second variation mentions the price before the product name. Now, the JavaScript that takes advantage of these kinds of section variations would look like this:

```
<script>
var v = utmx('variation-content', 'Section1');
if (v) {
document.write(
  v.replace("%%product_name%%", "<? print $product_name ?>").
    replace("%%product_price%%", "<? print $product_price ?>").
    replace("%%product_id%%", "<? print $product_id ?>"));
  document.write("</nosc" + "ript>");
}
</script>
<ul>
  <li>Product name: <? print $product_name ?>
  <li>Product price: <? print $product_price ?>
  <li><a href='buy.php?prod-id=<? print $product_id ?>'>
      Buy Now</a>
</ul>
</noscript>
```

The call to the utmx function, taking the arguments 'variation-content' and 'Section1' will return the section template for the section named "Section1" that includes the %%'ed tokens, which are replaced with the dynamic content. Note that the <?...?> tokens in the script are server-side PHP code. This example uses PHP, but any server-side system will work.

Please take note that visitors who have turned off JavaScript will see the default, unordered list of the dynamically generated content.

Gotcha alert: Always escape any JavaScript special characters when setting up the variables, such as quotes. Otherwise the JavaScript code will have errors.

Option 2 - Use an A/B experiment.

As noted earlier, an A/B experiment can be implemented two ways:

Option A: Create multiple physical copies of the dynamic page.

Option B: Have a single physical page with multiple virtual versions.

Let's look at the implementation details of each option.

Option A: Create multiple physical copies of the dynamic page.

For example:

- Original: product.php
- Test Variation B: product_b.php
- Test Variation C: product_c.php

From a technical integration perspective, this is the simplest option. It needs no special backend code to support GWO.

If version A is chosen for a visitor, any time they get to product.php the page will load and then immediately redirect them to product_a.php.

GWO will append the query string when doing a redirect, so if a visitor clicks:
`http://www.mysite.com/product.php?pid=72&group=boys&sid=1234`

...they will be redirected to:
`http://www.mysite.com/product_b.php?pid=72&group=boys&sid=1234`

For some sites, creating multiple copies of a dynamic page, such as the product page, creates additional problems unto itself. For instance, you now have to maintain and update all of the copies. Web analytics data is complicated as well, since we have several versions of the product page.

Sometimes having unique URLs for each version of the product page is a good thing, however. For one, you now have web analytics data for each version separately and can gain additional insights such as time on page, etc.

When setting up the experiment, here are the URLs you'd use:

- Original: `http://www.mysite.com/product.php`
- Test Variation A: `http://www.mysite.com/product_b.php`
- Test Variation B: `http://www.mysite.com/product_c.php`

Note: If your product.php page returns an error when no product ID is passed in, simply use the offline validation.

Option B: Have a single physical page with multiple virtual versions.

Each of the multiple virtual versions will dynamically include the content you want to test. You'll need to differentiate between the virtual versions using a query parameter in the URL, and add a few lines to the server side code of your page.

This method has an additional advantage: Since the file name is the same for all variations, only the parameters change, when the experiment is over and you've removed any GWO specific server side code, your users will never get a 404 (looking for a page that no longer exists). Just make sure the page won't crash on unrecognized parameters.

Let's say the page we want to test is product.php

You'll create a dynamically-included section for each version of the page you want to test. For example:

- Original: dynamic_include_a.php
- Test Variation B: dynamic_include_b.php
- Test Variation C: dynamic_include_c.php

The original version uses a URL something like this: http://www.mysite.com/product.php?pid=87

...and the virtual version will use a URL something like this:
http://www.mysite.com/product.php?pid=87&variation=b

Here is an outline and some pseudo-code for the original and modified versions of product.php:

Original version of product.php:

```
_stuff before the section we want to test_
<include file=dynamic_include_a.php>
_stuff after the section we want to test_
```

Modified version of product.php:

```
<if (variation is not defined in URL)
    <include gwo_display_control_code.js>
</if>

_stuff before the section we want to test_
<if (variation is not defined in URL)>
    <include file=dynamic_include.php>
<else>
    <include file=dynamic_include_($variation).php>
</if>
_stuff after the section we want to test_
```

Here's what will happen:

Scenario one: GWO chooses the original version of the page.

1. The user reaches `product.php?pid=123`
2. The GWO display code will be included and then executed (but not do anything)
3. `dynamic_include_a.php` will be included.

Scenario two: GWO chooses variation B of the page.

1. The user reaches `product.php?pid=123`
2. The GWO display code will be included and then executed, causing a redirect

3. The visitor will immediately be redirected to `product.php?pid=123&variation=b`
4. The page `product.php?pid=123&variation=b` loads
5. The GWO display code will NOT be included
6. `dynamic_include_b.php` will be included

When setting up this experiment, you'd use these URLs:

- Original: `http://www.mysite.com/product.php`
- Test Variation B: `http://www.mysite.com/product.php?variation=b`
- Test Variation C: `http://www.mysite.com/product.php?variation=c`

If your product.php page returns an error when no product id is passed in, simply use the offline validation.

Let's say you set up an A/B experiment with these values:

- Original page: `http://www.mysite.com/page.php`
- Test Variation B: `http://www.mysite.com/page.php?track=456&variation=b`
- Test Variation C: `http://www.mysite.com/page.php?track=789&variation=c`

A visitor reaches the page for the first time using this URL:

```
http://www.mysite.com/page.php?track=123&productID=72
```

GWO rolls the dice and chooses to redirect the visitor to the URL for variation B.

Since both the current URL and the test page URL have the *track* parameter, the visitor will be redirected to this URL: `http://www.mysite.com/page.php?track=456&productID=72&variation=b`

Point to remember

Technically, GWO does not append the parameters from the original page to the test page. It merges the parameters from the two URLs. GWO will favor the parameter values from the URLs for the alternative test pages entered during the experiment setup.

Other Advanced Stuff

Using Server Side Session Variables

If you're using a single physical page, and multiple virtual versions, you may also add back-end code that uses a server-side session variable to remember what variation to display for the user. Naturally, this requires some experience using session variables.

The advantage to this is that visitors will be redirected only once per session -- the first time they visit the test page. Later visits to the test page will use the session variable to show the correct version, so there's no need to redirect the user.

You'll need to add some server-side code to check the URL, and set a server-side session variable to store the variation value.

Here's some pseudo-code that adds the support of a session variable. (Changes from previous example are in blue.)

```
<if (variation is defined in URL)>
  <$session_variation = variation value from URL>
</if>

<if ($session_variation is not defined)
    <include gwo_display_control_code.js>
</if>

_stuff before the section we want to test_
<if ($session_variation is not defined)>
    <include file=dynamic_include.php>
<else>
    <include file=dynamic_include_($session_variation).php>
</if>
_stuff after the section we want to test_
```

Advanced A/B Testing

There are situations in which the A/B testing interface won't allow you to make the customizations you may want -- experiments that span multiple domains or copied experiments, for example.

In these situations, Website Optimizer supports a more manual implementation of A/B testing. You'll use the multivariate experiment creation flow in Website Optimizer to accomplish this:

1. Sign in to Website Optimizer.
2. Click **Create another experiment**.
3. From the Multivariate Experiment box, click **Create**.

Identify experiment pages

1. Enter an experiment name.
2. Enter your **Test page URL** and **Conversion page URL**. You'll identify your variation pages in a later step.
3. Click **Continue**. Website Optimizer will check for the existence of these pages on your server -- if they're not present or not accessible, select **The URL is correct** from the warning message and click **Continue** again.

Add JavaScript tags to experiment pages

This is Step 2 of the Website Optimizer tool provides the specific code to install on your pages.

For your original page:

1. Add both the Control Script and the Tracking script as described in the tagging instructions.
2. Ignore the instructions under Page sections, and instead add the following script, exactly as it appears below, immediately after the Control Script:

```
<!-- utmx section name="Test URL" -->
<script>
var b = utmx('variation_content', 'Test URL');
function filter(v) {
  var u = v[0].contents;
  if (b && u.substr(0,7) == 'http://' && b.substr(0, 7) != 'http://') {
    u = u.substr(7);
  }
  return u;
}
utmx('url', 'Test URL', 0, filter);
</script>
```

3. The filter function exists to strip off the 'http://' which the utmx function might prepend to the URL. This allows one to redirect to relative URL's.

For alternative pages (B, C, and other pages):

Add the Tracking Script as described in the tagging instructions.

For your conversion page:

Add the Conversion Script to your conversion page, at the very end of your source code (after the closing </body> tag) as described in the tagging instructions.

Once the process of tagging your pages is finished, click **Validate pages**. If your pages aren't accessible, click **Try offline validation** to upload your pages directly into Website Optimizer.

Click **Continue** to move on to Step 3.

Create Variations

In Step 3 of the Website Optimizer tool:

1. Click **Add new variation**.
2. Enter a name for this variation and click **Add**.
3. In the text box, enter the URL for alternative page for this variation. This should be on a single line with no additional whitespace before or after the URL..
4. Click **Save**.
5. Click **Preview** - Website Optimizer will display your variation page.
6. Repeat the steps above for any additional variation pages (your C, D, and other pages).
7. Click **Save and continue** to move to Step 4.

Review and launch

1. Double-check your experiment setup, and designate how much traffic to include in the experiment.
2. Click **Launch now** to launch the experiment.
3. View your reports

Although the reports will not offer any definitive conclusions for a while, you should check your reports after a few hours to make sure impressions and conversions are being recorded, and that the traffic recorded in the experiment is consistent with the traffic measured by your web analytics tools. Zero impressions and conversions, or serious discrepancies, may indicate that the experiment tags were not installed correctly.

Note that each alternative page is considered a 'combination' in your reports. Page section reports can be ignored during A/B testing, as you're concerned with entire pages (combinations) instead of page sections.

Stopping the experiment

You can stop the experiment at any time, regardless of whether or not Website Optimizer has identified a clear winner. The experiment will continue for as long as you want it to.

(Note: You can get these same details in this AdWords Help Center entry: http://adwords.google.com/support/bin/answer.py?answer=62999.)

Segmenting traffic

Here's another popular question: "How can I segment traffic so only some of my users are part of my experiment?"

Why do that? So you can remove any internal traffic from the experiment, test only new visitors, only users coming from AdWords, or manage other variables. Google Website Optimizer doesn't do this out of the box though we hope to add it in the future.

But! Let us pass on this workaround suggested by a user:

> "If your pages aren't static HTML pages, you can simply add some backend code that conditionally outputs the GWO code. Here is some pseudo code:
>
> ```
> < if (show visitor GWO code)>
> include gwo_code.include
> </if>
> ```
>
> Make sure to use conditional logic for all sections of the test page!
>
> Also, from a testing perspective, if a visitor isn't shown the experiment at first, that visitor should continue to not see the experiment.
>
> If you're running an MVT experiment this includes the Control Script, the Section Script and the Tracking Script. If you're running an A/B this includes the Control Script (on the original page) and the Tracking Script (on the original and all test pages)
>
> You don't have to worry about conditionally including the Conversion Script on the conversion page. If a visitor reaches the conversion page without having executed the Control Script, they won't be counted as part of the experiment."

Detailed Reporting: GWO Users Pitch In

Google Website Optimizer focuses on visitors and conversions. But suppose you'd like to get even *more* detailed analytical information for each combination? Stats like time spent on each page, bounce rates, keyword segmentation, date breakdown, etc.

Well, you can -- again, thanks to a clever trick by some of our GWO users. The bright minds at ROI Revolution (one of our Website Optimizer Authorized Consultants) came up with some JavaScript code that can be added to pages to make each combination look like its own page. They describe the process here:

http://www.roirevolution.com/blog/2008/11/google_website_optimizer_renews.html

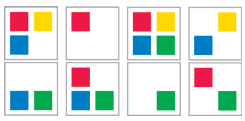
Thanks, guys!

Going one better, here's a script that has the heart of their idea in it, but with a much more simplified version of the code:

```
<script type="text/javascript">
if (utmx('combination') != undefined) {
 var l = document.location, s = l.search;
 s += s.length ? '&' : '?';
 s += 'combo=' + utmx('combination');
 var pt = _gat._getTracker("UA-123456-1");
 pt._trackPageview(l.pathname + s);
}
</script>
```

To use this code, you replace the Google Analytics tracking script on your test page with the above code. Remember to replace UA-123456-1 with your own Analytics profile ID. You'll then see the different combinations listed in your Google Analytics reports.

Wrapping it up

That's the end of the Techie Guide, for now. We're constantly at work building new features and finding new ways to use Website Optimizer, as are our users. We'll be updating this guide regularly with the latest advanced testing techniques. Until then, don't stop testing until your conversion rate is 100%.

--the Website Optimizer team