

Puzzle Solving FUNdamentals



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27 October 2011

Tonight's Tantalizing Topics:



- 1 What are "Mystery" Caches?
- 2 Breaking Down the Puzzle Listing
- 3 Puzzle Solving Techniques
- 4 Specific Puzzle Examples
- 5 Online Puzzle Resources
- 6 Puzzle Solving Competition!



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What are Mystery Caches?



- ❖ AKA "Puzzle" or "Unknown" cache
- ❖ A Mystery cache involves two "hunts"; completing some type of brain-powered task followed by a hunt for a traditional cache container in the field
- ❖ In most cases, the actual coordinates to the cache are simply hidden or encoded in the cache listing somehow



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What are Mystery Caches?



The published coordinates of a Puzzle Cache are NOT for the actual location of the Cache Container! Though they **might** be for a Parking Area or Trailhead.

The actual coordinates should be within 2 miles of the published coordinates.

The published coordinates MAY have something to do with the Puzzle. Look for the Field Puzzle Attribute and hints or instructions in the listing if you are expected to go to the published coordinates to solve for the final cache.



Breaking Down the Listing



- Contemplate the exterior of the quadrilateral parallelogram...
- Specific word choices matter!
- Look at everything that the Cache Owner can change or customize on the Cache Listing:

- | | |
|---|--|
| <input type="checkbox"/> Cache Name | <input type="checkbox"/> Bookmark Lists & Trackables |
| <input type="checkbox"/> Placed By (Always links to CO) | <input type="checkbox"/> Short & Long Descriptions (HTML) |
| <input type="checkbox"/> Date Placed (Must be in past) | <input type="checkbox"/> Hints/Spoiler Info (ROT-13 Encoded) |
| <input type="checkbox"/> Related Web Page (Hyperlink) | <input type="checkbox"/> Additional Waypoints & Images |
| <input type="checkbox"/> Background Image | <input type="checkbox"/> Owner Logs (Notes, Maintenance, etc.) |

Names, Dates, Links...



The screenshot shows a Geocache listing for 'Dancing Fall Angies' (GC29RXXF). Red annotations highlight several key elements:

- Cache Name:** 'Dancing Fall Angies'
- Date:** '06/03/2010'
- Placed By:** 'SSQ JOAT'
- Web Link:** A link to a related web page.
- Published Coordinates:** 'N 60° 29.250 W 151° 05.065'
- Attributes:** A set of icons at the bottom right, including a puzzle piece, a magnifying glass, and a gear.

Image Gallery, Maps, Logs...



Find...

- ...other caches **hidden** or **found** by this user
- ...nearby caches of this type, that I haven't found
- ...all nearby caches that I haven't found
- ...all nearby waymarks on Waymarking.com
- ...all nearby benchmarks
- ...nearby hotels

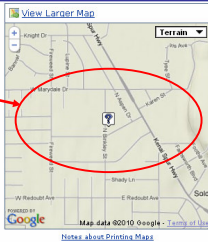
For online maps...

- Geocaching.com Google Map
- MyTopo Maps
- Google Maps
- MapQuest
- Bing Maps
- Yahoo Maps
- Rand McNally
- MSR Maps (Formerly Terraserver)
- Open Cycle Maps
- Open Cycle Maps

90-Column Printout

2 Logged Visits - [View the Image Gallery](#)

Warning! Spoilers may be included in the descriptions or links.



Location of Published Coordinates

Images

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Descriptions, Backgrounds, Bookmarks, Trackables...



The Cache is NOT at the Published Coordinates



Trackables may have comments

It will be necessary to find the first 7 HP caches before the final cache can be completed. Each of the first 7 colorful micros are concealed by an invisibility cloak to keep them secret from passing muggles. Please replace the cache exactly as found. Pay careful attention to anything HP related about the cache and log. Good luck!

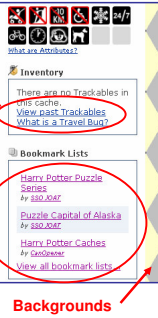
Use the first 7 caches in order by the primary color of the container:

Yellow -- Black -- Red -- Gold

Yellow -- Bronze -- Silver -- Green

Bookmark Lists may have comments

Backgrounds



There are no Trackables in this cache.

View past Trackables

What is a Travel Bug?

Harry Potter Puzzle Series

Puzzle Capital of Alaska

Harry Potter Caches

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HTML Source Code



```
<div class="UserSuppliedContent">
  <span id="ctl00_ContentBody_ShortDescription"><p>The cache is <b>NOT</b>
at the published coordinates.</p>
<!--For demonstration purposes only, this is a comment or remark line. It can be viewed in the
HTML source code, but is not visible on the Cache Listing when viewed in a browser.-->
</span>

</div>
<br />
<div class="UserSuppliedContent">

  <span id="ctl00_ContentBody_LongDescription"><p>Can you help Scooby,
Shaggy, Fred, Velma, and Daphne solve this
mystery? So far in this episode, Velma has found a reference to
someplace around <b>4358356358 NW 01' Factory Hill</b> but this clue
has only magnified the difficulty of this case. With your help,
it's a good bet that Scooby will be able to sniff this one out by
the end of the show.</p>
</div>
<img src=
"http://img.geocaching.com/cache/0c5b046d-d655-4512-8711-4f70bd14cef9.jpg"
alt="Scooby Puzzle" /></div>
```

Remarks

The HTML source may reveal secrets in the "User Supplied" Sections

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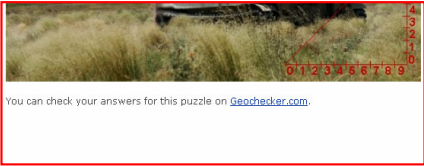
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Control, eh? Invisible Ink!

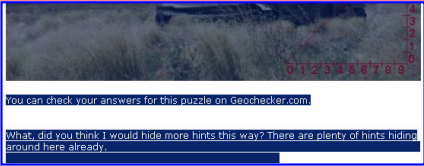


Normal view:



You can check your answers for this puzzle on geocheker.com.

Highlighted:



You can check your answers for this puzzle on [Geocheker.com](http://geocheker.com).

What did you think I would hide more hints this way? There are plenty of hints hiding around here already.

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Solving Puzzles



- ✦ Compile all information about the puzzle from the cache listing
- ✦ Group the info and try to make connections between elements
- ✦ Solving a puzzle requires deep thought, research, and lots of scratch paper!
- ✦ Don't give up! If you don't see the method today, set it down and come back later!



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Breaking Things Down



Google Everything

- ✦ Thesaurus & Dictionary
- ✦ Look up all unusual words
- ✦ Specific words are chosen for a purpose as they should help lead to the solution
- ✦ An internet search of the right terms may reveal the puzzle's method or solution



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Beware of Fluff!



- ☺ Puzzle builders can be very devious and mentally twisted people (*trust me, I know*)
- ☺ Many times, there will be false trails and extraneous information on the listing
- ☺ Often, what looks like the obvious bit of info may in fact be “fluff” that is only there as a distraction from the real puzzle
- ☺ Make sure you don’t get “Tunnel Vision”!

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Solving Puzzles



- You know the solution is the **Coordinates**
- Look for groups of items that may represent numbers:
 - 15** digits in **60° 12.345' 150° 67.890'**
 - 10** digits in just the minutes portion
 - 6** digits in just the fractional minutes
- *Example:* If the puzzle has 10 images on it, each image could represent a number for the minutes portion of the coordinates

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Whole or Parts?



- The solution to the puzzle may or may not include the entire DMM coordinates of the cache
- Sometimes you’ll see the published coordinates are simply “rounded down” to the whole minute
- This often means the solution is the 3 digits to the right of the decimal in the minutes portion of the coordinates, so you’re looking for 6 numbers
- Published Coords: **N60° 14.000' W155° 26.000'**
- The answer might be: **60° 14.523' 155° 26.419'** with the numbers **523** and **419** in the puzzle

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Give These a Try! 


 Frank, Igor, Victor, and Elvira got on the Transylvanian West heading to Ordu for the annual Turkish Holiday Regatta where many of Eastern Europe's finest were gathering.



 Acme sold 162,948 Super Widgets during the second quarter of 2011. Fixed quarterly production costs were \$275,212 with a per widget manufacturing cost of \$250. The net profit from widget sales for the second quarter was \$27,263,000. How much did each widget sell for?

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The Solutions! 

This sentence sounds pretty “fluffy”, right? So, take a look at some of the oddities, for instance, note the capitalization used...

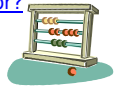
 Frank, Igor, Victor, and Elvira got on the Transylvanian West heading to Ordu for the annual Turkish Holiday Regatta where many of Eastern Europe's finest were gathering.

 Will you look at that! **FIVE TWO THREE** 


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The Solutions! 

Acme sold 162,948 Super Widgets during the second quarter of 2011. Fixed quarterly production costs were \$275,212 with a per widget manufacturing cost of \$250. The net profit from widget sales for the second quarter was \$27,263,000. How much did each widget sell for?

Show of hands... Who Loves Math? 

$162,948 \times \$250 = \$40,737,000$ total unit production cost
 Add in \$275,212 fixed and \$27,263,000 net = \$68,275,212

 Divide by 162,948 widgets for **\$419** each!
 Yes, there are other mathematical ways to get this solution

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Coord Formats



- Watch out for alternate Coordinate Formats, especially on math problems!
- A solution of **60.55123** could be:
- In our usual **DMM**, it is **60° 55.123'**
- If it is **DD**, then **60.55123°** or **60° 33.074'**
- If it is **DMS**, then **60° 55' 12.3"** becomes **60° 55.205'**

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Writing Out Coordinates



- **Warning!** We don't always use numbers!
- This: **N 60° 29.190' W 151° 07.715'**
- Becomes this:

North sixty degrees twenty nine point
one hundred ninety minutes west one
hundred fifty one degrees seven point
seven hundred fifteen minutes

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Encoding Coords



To help hide the words being encrypted, we will sometimes break the words into groups of perhaps 3, 4, or 5 letters like this:

**nort hsix tyde gree stwe ntny inep oint
oneh undr edni nety minu tesw esto nehu
ndre dfif tyon edeg rees seve npoi ntse
venh undr edfi ftee nmin utes**

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Codes & Ciphers



- You're already familiar with the basic substitution cipher called the Caesar Shift
- Every cache page has the ROT13 Cipher listed on it:



Decryption Key
A|B|C|D|E|F|G|H|I|J|K|L|M

N|O|P|Q|R|S|T|U|V|W|X|Y|Z
(letter above equals below, and vice versa)

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Caesar

For your eyes only



- ✘ The 26 letters of the alphabet can be shifted any number of positions
- ✘ If you were to shift 2 places, then A=C, B=D, and C=E, and so on through Z=B
- ✘ While a 13 place shift gives A=N and N=A, any other shift will not result in the same switch both ways

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Codes & Ciphers



After running the previous coordinates through a simple Caesar Shift, we get this:

**YZCE SDTI EJOP RCPP DEHP YEJY
TYP A ZTYE ZYPS FYOC POYT YPEJ
XTYF EPDH PDEZ YPSF YOCP OQTQ
EJZY POPR CPPD DPGP YAZT YEDP
GPYS FYOC POQT QEPP YXTY FEPD**

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Reversed Shift



- A simple variation on the Caesar Shift
- Start with the regular alphabet, but rather than shifting the encoded line in Caesar style, reverse it from Z to A, like this:

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ZYXWVUTSRQPONMLKJIHGFEDCBA



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Substitution Ciphers



- ♣ Anything can be used to represent the letters of the alphabet or even the ten digits which make up all numbers
- ♪ It can be pictures or symbols of anything, often puzzlers will just use strange Fonts
- ♀ The true puzzle is just finding out the key to decode the message back to plain text

♣ ♪ ♀ ♁ ♂ ♃ ♄ ♅ ♆ ♇ ♈ ♉ ♊ ♋ ♌ ♍ ♎ ♏ ♐ ♑ ♒ ♓ ♔ ♕ ♖ ♗ ♘ ♙ ♚ ♛ ♜ ♝ ♞ ♟ ♠ ♡ ♢ ♣ ♤ ♥ ♦ ♧ ♨ ♩ ♪ ♫ ♬ ♭ ♮ ♯ ♺ ♻ ♼ ♽ ♾ ♿

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Image Manipulation



- ✦ *Steganography* – Messages hidden inside the computer code of the image itself
- ✦ Save all images to your computer
- ✦ Look at the Image Properties
- ✦ Open image with a Photo Editor
- ✦ Zoom in and look all over the image for signs of editing, hints, codes, or even the coordinates themselves



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Image Manipulation



It's easy to hide stuff in Images

Do you see the Coordinates?



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Image Manipulation



Zoom In and there they are...

To make life even more interesting, imagine if we encoded the coordinates first. (hint... we have)



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Use the Internet!



- The only way to get better at puzzle solving is to practice!
- This Blog posts a Geocaching Puzzle of the Day, every day from all over the USA: geocachingpuzzleoftheday.blogspot.com
- Everyone needs to work through the first 9 caches of the [Puzzle Solving 101](#) series

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Solving Puzzles



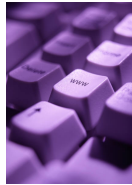
A few "Rules" about solving puzzles...

- ✓ Never ask for help with a puzzle on public internet forums (e.g. Groundspeak forums)
- ✓ Never post the solution to a puzzle or give the final location anywhere on the internet
- ✓ Never post any hints about how to solve the puzzle in your online logs – If you do post any hints, expect your log to be deleted
- ✓ Finding the final cache without actually solving the puzzle doesn't justify a "find"

Resources



- GS Knowledge Books: <http://support.groundspeak.com/>
- Purple Hell: <http://www.purplehell.com/>
- Rumkin Cipher Tools: <http://rumkin.com/tools/cipher/>
- Omniglot Writing: <http://www.omniglot.com/>
- Puzzlehead Blog: <http://www.puzzlehead.org/>
- Online Substitution Cipher Solver: <http://25yearsofprogramming.com/fun/ciphers.htm>
- Parmstro's Puzzle Guide: <http://parmstro.weebly.com/solving-puzzles.html>
- Florida's Puzzle Solving 101 Cache Series by ePeterso2: <http://www.geocaching.com/bookmarks/view.aspx?guid=3713d813-62ba-40ac-b0ef-901807ba9c98>
- Puzzle Capital of Alaska Bookmark List for the Central Kenai Peninsula: <http://www.geocaching.com/bookmarks/view.aspx?guid=3e9b65ac-aebb-465f-9cb1-095a64292485>
- GeocacheAlaska! Forums: <http://geocachealaska.proboards.com/>



COMPETITION!!!



- ♦ I've hidden a practice Puzzle for you to try and Solve!
- ♦ The First To Solve (FTS) will get a nice prize from GeocacheAlaska!, which will be mailed to them upon successful completion.
- ♦ A PDF copy of this presentation will be posted to the GeocacheAlaska! website's Education page around 9:30pm tonight. You MUST download a copy of the full-size version to access the hidden puzzle. Part of the puzzle is in this presentation, and the rest is out on the internet. The solution includes instructions on how to prove that you have solved the puzzle. Follow them exactly!
- ♦ I will post a description of how to solve this puzzle as a note to each event listing after we have a FTS logged, so that everyone can learn.
- ♦ Important note about this puzzle... nearly every image in this presentation is hyperlinked! Most take you to places to learn more about the topic at hand and really have little to do with this puzzle.
- ♦ Go to the next slide when you're ready to start. Enjoy!
