Beginners Session 5a
MACD – STOCHASTICS – RSI

a) **What Does Moving Average Convergence Divergence - MACD Mean?**
A trend-following momentum indicator (remember momentum is measured when a smaller moving average crosses a larger moving average)
b) MACD shows the relationship between two moving averages of prices.
c) The MACD is calculated by subtracting the 26-day exponential moving average (EMA) from the 12-day EMA.
d) A nine-day EMA of the MACD, called the "signal line", is then plotted on top of the MACD, functioning as a trigger for buy and sell signals.

There are three common methods used to interpret the MACD:

1. **Crossovers** - As shown in the chart above, when the MACD falls below the signal line, it is a bearish signal, which indicates that it may be time to sell. Conversely, when the MACD rises above the signal line, the indicator gives a bullish signal, which suggests that the price of the asset is likely to experience upward momentum. Many traders wait for a confirmed cross above the signal line before entering into a position to avoid getting "faked out" or entering into a position too early, as shown by the first arrow.

2. **Divergence** - When the security price diverges from the MACD. It signals (potentially) the end of the current trend.

3. **Dramatic rise** - When the MACD rises dramatically - that is, the shorter moving average pulls away from the longer-term moving average - it is a signal that the security is (potentially) overbought and will soon return to normal levels.

Traders also watch for a move above or below the zero line because this signals the position of the short-term average relative to the long-term average. When the MACD is above zero, the short-term average is above the long-term average, which signals upward momentum. The opposite is true when the MACD is below zero. As you can see from the chart above, the zero line often acts as an area of support and resistance for the indicator.

**What Does Signal Line Mean?**
A moving average plotted alongside a technical indicator and is used to create transaction signals. Buy signals are generally created when the indicator crosses above the signal line, while sell signals are generated when the indicator crosses below it. The MACD indicator and the stochastics oscillator are the two most popular tools used in technical analysis that generate transaction signals by using a signal line. Most trigger lines are created by using a three- to nine-period moving average of the indicator values.

A signal line is also commonly known as a "trigger line."
What Does Crossover Mean?

1. The point on a chart when a security and an indicator intersect. Crossovers are used by technical analysts to aid in forecasting the future movements in the price of a stock. In most technical analysis models, a crossover is a signal to either buy or sell.

Below we have a security that falls below its 20-day moving average - a bearish sign.

2. The point where a moving average crosses over another moving average as in MACD above.

What Does Divergence Mean?

In technical analysis, divergence is considered either positive or negative, both of which are signals of major shifts in the direction of the price. Positive divergence occurs when the price of a security makes a new low while the indicator starts to climb upward. Negative divergence happens when the price of the security makes a new high, but the indicator fails to do the same and instead closes lower than the previous high.

What Does Fakeout Mean?

A term used in technical analysis to refer to a situation in which a trader enters into a position in anticipation of a future transaction signal or price movement, but the signal or movement never develops and the asset moves in the opposite direction.

Investopedia explains Fakeout

The possibility for fakeouts is the reason why traders should use more than one indicator to make decisions. To reduce the probability of being faked out, experienced traders will require four or more signals to confirm a decision.
What Does Overbought Mean?
1. A situation in which the demand for a certain asset unjustifiably pushes the price of an underlying asset to levels that do not support the fundamentals.

2. In technical analysis, this term describes a situation in which the price of a security has risen to such a degree - usually on high volume - that an oscillator has reached its upper bound. This is generally interpreted as a sign that the price of the asset is becoming overvalued and may experience a pullback.

Investopedia explains Overbought
1. An asset that has experienced sharp upward movements over a very short period of time is often deemed to be overbought. Determining the degree in which an asset is overbought is very subjective and can differ between investors.

Stochastic and MACD

Ask any technical trader and he or she will tell you that the right indicator is needed to effectively determine a change of course in a currencies price patterns. But anything that one “right” indicator can do to help a trader, two complimentary indicators can do better. This article aims to encourage traders to look for and identify a simultaneous bullish MACD crossover along with a bullish stochastic crossover and then use this as the entry point to trade.

Pairing the Stochastic and MACD

Looking for two popular indicators that work well together resulted in this pairing of the stochastic oscillator and the moving average convergence divergence (MACD). This team works because the stochastic is comparing a stock’s closing price to its price range over a certain period of time, while the MACD is the formation of two moving averages diverging from and converging with each other. This dynamic combination is highly effective if used to its fullest potential. (For background reading on each of these indicators, see Getting To Know Oscillators: Stochastics and A Primer On The MACD.)
Working the Stochastic
There are two components to the stochastic oscillator: the %K and the %D. The %K is the main line indicating the number of time periods, and the %D is the moving average of the %K.

Understanding how the stochastic is formed is one thing, but knowing how it will react in different situations is more important. For instance:

- Common triggers occur when the %K line drops below 20 - the stock is considered oversold, and it is a buying signal.
- If the %K peaks just below 100, then heads downward, the stock should be sold before that value drops below 80.
- Generally, if the %K value rises above the %D, then a buy signal is indicated by this crossover, provided the values are under 80. If they are above this value, the security is considered overbought.

Working the MACD
As a versatile trading tool that can reveal price momentum, the MACD is also useful in the identification of price trend and direction. The MACD indicator has enough strength to stand alone, but its predictive function is not absolute. Used with another indicator, the MACD can really ramp up the trader's advantage. (Learn more about momentum trading in Momentum Trading With Discipline.)

If a trader needs to determine trend strength and direction of a stock, overlaying its moving average lines onto the MACD histogram is very useful. The MACD can also be viewed as a histogram alone. (Learn more in An Introduction To The MACD Histogram.)

MACD Calculation
To bring in this oscillating indicator that fluctuates above and below zero, a simple MACD calculation is required. By subtracting the 26-day exponential moving average (EMA) of a security's price from a 12-day moving average of its price, an oscillating indicator value comes into play. Once a trigger line (the nine-day EMA) is added, the comparison of the two creates a trading picture. If the MACD value is higher than the nine-day EMA, then it is considered a bullish moving average crossover.

It's helpful to note that there are a few well-known ways to use the MACD:

- Foremost is the watching for divergences or a crossover of the centre line of the histogram; the MACD illustrates buy opportunities above zero and sell opportunities below.
- Another is noting the moving average line crossovers and their relationship to the centre line. (For more, see Trading The MACD Divergence.)

Identifying and Integrating Bullish Crossovers
To be able to establish how to integrate a bullish MACD crossover and a bullish stochastic crossover into a trend-confirmation strategy, the word "bullish" needs to be explained. In the simplest of terms, "bullish" refers to a strong signal for continuously rising prices. A bullish signal is what happens when a faster moving average crosses up over a slower moving average, creating market momentum and suggesting further price increases.

- In the case of a bullish MACD, this will occur when the histogram value is above the equilibrium line, and also when the MACD line is of a greater value than the nine-day EMA, also called the "MACD signal line."
- The stochastic's bullish divergence occurs when %K value passes the %D, confirming a likely price turnaround.

Crossovers In Action:
Below is an example of how and when to use a stochastic and MACD double cross.
Note the green lines that show when these two indicators moved in sync and the near-perfect cross shown at the right-hand side of the chart.

You may notice that there are a couple of instances when the MACD and the stochastics are close to crossing simultaneously but in actual fact they did not if you look closely enough.

**The Strategy**
First, look for the bullish crossovers to occur within two days (or bars) of each other. Keep in mind that when applying the stochastic and MACD double-cross strategy, ideally the crossover occurs below the 50 line on the stochastic to catch a longer price move. And preferably, you want the histogram value to be or move higher than zero within two bars of placing your trade.

Also note that the MACD must cross slightly after the stochastic, as the alternative could create a false indication of the price trend or place you in sideways trend.

**Trick of the Trade**
The stochastic and MACD double cross allows for the trader to change the intervals, finding optimal and consistent entry points. This way it can be adjusted for the needs of both active traders and investors. Experiment with both indicator intervals and you will see how the crossovers will line up differently, and then choose the number of days that work best for your trading style. You may also want to add an RSI indicator into the mix, just for fun. (Read *Ride The RSI Rollercoaster* for more on this indicator.)

**Conclusion**
Separately, the stochastic oscillator and MACD function on different technical premises and work alone. Compared to the stochastic, which ignores market jolts, the MACD is a more reliable option as a sole trading indicator. However, just like two heads, two indicators are usually better than one! The stochastic and MACD are an ideal pairing and can provide for an enhanced and more effective trading experience.

For further reading on using the stochastic oscillator and MACD together, see *Combined Forces Power Snap Strategy*. 
What Does Relative Strength Index - RSI Mean?

A technical momentum indicator that compares the magnitude of recent gains to recent losses in an attempt to determine overbought and oversold conditions of an asset. It is calculated using the following formula:

RSI = 100 - 100/(1 + RS*)

*Where RS = Average of x days' up closes / Average of x days' down closes.

As you can see from the chart, the RSI ranges from 0 to 100. An asset is deemed to be overbought once the RSI approaches the 70 level, meaning that it may be getting overvalued and is a good candidate for a pullback. Likewise, if the RSI approaches 30, it is an indication that the asset may be getting oversold and therefore likely to become undervalued.

Investopedia explains Relative Strength Index - RSI

A trader using RSI should be aware that large surges and drops in the price of an asset will affect the RSI by creating false buy or sell signals. The RSI is best used as a valuable complement to other tools.

relative strength indicator (RSI) is one of the oldest and most popular tools in technical analysis. In fact, if there was a hall of fame for technical analysis indicators, RSI would certainly be accorded top-five status. Its ability to measure turns in price by measuring turns in momentum is unmatched by almost any other tool in technical analysis.

The standard RSI settings of 70 and 30 serve as clear warnings of overbought and oversold territory.

The "RSI rollercoaster" is a setup that can take advantage of these turns in the market. Read on as we cover this strategy and show you how it works in real-life trading examples. (For background reading, see Momentum And The Relative Strength Index and Getting To Know Oscillators: RSI.)

Background

The purpose of the RSI rollercoaster is to harvest points from range-bound currency pairs. First and foremost, this setup works best in a range environment when overbought and oversold readings are far more likely to be true signals of a change in direction. The setup is also much more accurate on the daily charts than on smaller time frames.
like hourly charts. The primary reason for this difference is that daily charts incorporate far more data points into their subsets and, therefore, turns in momentum tend to be more meaningful on longer time frames.

Nevertheless, the asymmetrical structure between risk and reward in this setup makes even the shorter time frames worth considering. Just keep in mind that although the setup will fail far more frequently on the shorter term hourly charts than on the daily ones, the losses will generally be far smaller, keeping the overall risk manageable.

**Rules for a Long Trade**
1. RSI reading must be less than 30.
2. Wait for an up candle to form and close with an RSI reading of greater than 30.
3. Go long at market on the open of the next candle.
4. Place your stop at the swing low.
5. Exit half of the position at 50% of the risk and immediately move the stop on the rest to breakeven.
6. Exit the rest of the position when one of the following conditions is met:
   a. Stopped at breakeven.
   b. Trade first moves into overbought territory marked by an RSI readings of greater than 70 and then eventually drops from that zone. As soon as RSI declines below 70, sell at market on the close of that candle.

**Rules for a Short Trade**
1. RSI reading must be greater than 70.
2. Wait for a down candle to form and close with an RSI reading of less than 70.
3. Go short at market on the open of the next candle.
4. Place the stop at the swing high.
5. Exit half of the position at 50% of the risk and immediately move the stop on the rest to breakeven.
6. Exit the rest of the position when one of the following conditions is met:
   a. Stopped at breakeven.
   b. Trade first moves into oversold territory marked by RSI readings of less than 30 and then eventually rises out of that zone. As soon as RSI increases above 30, buy at market on the close of that candle.

The key to this RSI strategy - versus the traditional interpretation of RSI, which simply trades overbought or oversold levels - is to first look for a reversal candle, which provides us with a sign of exhaustion before taking the trade. This way, we are prevented from prematurely picking a top or bottom and instead we wait for indicator confirmation. Note that the RSI rollercoaster is designed to squeeze as much profit as possible out of the turn trade. Instead of immediately closing out a position when it moves from oversold to overbought, the RSI rollercoaster keeps the trader in the market until price shows a sign of exhaustion. Sometimes a strong move will generate multiple consecutive periods of overbought RSI readings, and this setup is specifically intended to catch part of these potentially profitable moves.

Note also that the RSI rollercoaster is almost always in the market, as the rule for the liquidation of a long trigger is the creation of a fresh short position. The only two times this setup stays out of the market is when the trader is stopped out of his position on a false signal or when he is stopped out at breakeven on the second half of his position. Now let’s take a look at some examples.
Daily Charts

In our first example (Figure 1), we look at the AUD/JPY currency pair from approximately December 12, 2005, to April 1, 2006. On December 12, the pair records an RSI reading of 73.84, but at the close of the very next candle the RSI drops to 48.13 and we go short at 88.57. Our stop is set at the most immediate swing high of 91.33, or 276 points back. Our first target is set at 50% of our risk, or 138 points forward. The very next day the pair collapses further and our first profit target is realized. We then move our stop to breakeven and stay in the position until RSI reaches oversold territory. On December 27, 2006, RSI moves up from severely oversold readings below 30 to 30.70. We exit the second half of the trade at 85.01, harvesting 356 points. Immediately, we initiate a long position at the same price as the RSI rollercoaster has now indicated a buy setup. Our stop is set at the nearest swing low of 84.51. Our risk is a relatively small 50 points and, therefore, our first profit target is a very modest 25 points, which we achieve in the very next candle when prices rise to 85.26. We move our stop to breakeven and stay in the trade for more than a month until February 6, 2006, when RSI leaves the overbought territory and we liquidate the rest of our position at 88.23 for a 322-point profit.

Again, we immediately sell at the same price to establish a new short, as per the setup. The swing high of 89.34 serves as our stop. The first target of 87.68 is achieved the very next day as we bank 55 points. We exit the rest of the position at 84.01 when RSI once again returns from its oversold level. The second half of the position produces a 422-point gain. All in all, the RSI rollercoaster generates a very respectable 660 points (1319/2) over a four-month time frame.

Some traders may not have enough patience to trade the RSI rollercoaster on daily charts, so the next example of the setup is on four-hour charts.

Four-Hour Charts
In the four-hour chart of the EUR/USD (Figure 2), we see the RSI rollercoaster perform well once again. We start on March 21, 2006, as RSI, after spending some time in the overbought zone above 70, finally falls below that value, triggering a short order at market at 1.2178. The swing-high stop is extremely close at 1.2208, allowing us to risk only 30 points on the trade. Our first target at 1.2163 is hit within the next candle and we move the stop to breakeven and follow the trade. The pair eventually trades down to 1.2035 before regaining upside momentum, and we are able to close out the second half of the position with an additional 138-point profit. We then immediately go long at the same price. This time our risk is considerably larger at 100 points, as the swing low lies at 1.1935. Nevertheless, the pair climbs steadily and we reach our first target with ease, exiting at 1.2085 for a 50-point gain. We then stay in the trade until the rules of the setup force us to liquidate at breakeven. All in all, in this example of the RSI rollercoaster we are able to harvest a total of 203 points while risking only 260 points. Although in this sequence the risk reward ratio is a bit less than 1:1, the high probability aspect of this setup generally assures positive expectancy overall.

The RSI on a Short Time Frame

Turning now to the one-hour time frame, we see that the RSI rollercoaster performs far worse on the shorter time frame. Starting on April 3, 2006, the setup triggers a short at 1.3090 with a 35-point stop at the swing high of 1.3125. The trade moves our way almost instantly, and we are able to quickly cover half the position for 17-point profit. Again we move our stop to breakeven and stay in the trade all the way to 1.2902, harvesting 197 points in the process. However, before we celebrate too quickly, the setup triggers an immediate long trade and generates three consecutive stop-outs as the RSI peaks above the 30 level only to retreat into oversold territory once again. Overall, we lose -28, -36 and -47 points times two lots.

The cumulative loss? Minus 222 points. The three losses fully negate our one big win, and we actually stand at the end of the run down eight points. To add insult to injury, when the pair does make a turn to the upside, we miss the entry because the rally starts from RSI values above 30 and our setup does not trigger a signal.
One solution to this problem is to simply not trade the RSI rollercoaster on time frames of less than four hours in length. This setup is designed to catch major turns in price action and it works best in range-bound markets that consistently move from overbought to oversold states. The hourly charts are simply too sensitive for the indicator, generating many false-turn signals when prices pause rather than change direction.

**Adjustments for Shorter Time Frames**

On the hourly charts, it is far easier for RSI to work off the temporary overbought/oversold conditions without making a true turn. Nevertheless, the setup may still be productive for shorter term traders if we add some modifications. The key to making the RSI rollercoaster successful on the hourly or shorter time frames is to never assume greater than 30-point risk on any trade. In fact, 30 points of risk should be the maximum that the trader is willing to absorb on any one given trade. Ideally, the risk on any hourly version of the RSI rollercoaster should be no more than 15 points. This change will, of course, force traders to pass up many setups, but on the flip side they would be able to sustain three or even four consecutive losses in a row with only minimal damage to their equity; and only one good trade of 100 points or more would put the account right back into positive territory. On the hourly time frames, the signal-to-noise ratio will inevitably increase; therefore, it is vital to minimize the many likely losses in order to maintain a positive expectancy in the setup.

Figure 3: RSI Rollercoaster, USD/CHF
Finally, let's take a look at the RSI rollercoaster on the GBP/USD hourly charts during the period from March 27, 2006, to March 29, 2006. We will follow the exact same rules as outlined above, with one modification: If our risk exceeds 35 points, we will not take the trade. On March 27 at 1:00am, we trigger a short sale at 1.7458, risking 24 points. The trade goes against us, and we get stopped out as the pair works off the overbought condition and trades higher. Later in the day, we get a second signal and once again go short at 1.7477. Our risk is a miniscule 10 points. We set our target at 50% of risk and cover the first part of the trade at 1.7472, moving the stop to breakeven. Once again the trade moves away from us, but we cover at our entry point, and for all intents and purposes, the trade turns into a scratch instead of another loser.

At about midday on March 28, we get a third signal to short at 1.7504. This time the risk is a more considerable 32 points, but it is just within our self-imposed risk-control rule of 35 points. We cover half the position at 1.7488, garnering 16 points, and then follow the trade all the way down to 1.7315, harvesting a very impressive 189 points on the second half of the trade. The total gain from this three-day foray into trading the pound is 162 points, but note that the vast bulk of the profits were netted from the final half position of the third trade.

In fact, that 189-point move was responsible for more than 90% of all the trading gains of the setup. The rest of the time we lost a bit or essentially broke even.

**Conclusion**
The RSI rollercoaster is a low-probability/high-reward setup. As such, it requires that the trader take as many trades as his or her risk-control rules will allow to optimize the chance of catching the one big win. The trader should also take very small, highly defined risks while waiting patiently
for the big-profit trade. In the RSI rollercoaster, half the value of the strategy comes from the rules themselves, while the other half is derived from a strict money management approach.

**Please remember:** This document has “Ideas” for using the RSI, MACD and STOCHASTIC and FX Market Watch do not in any way shape or form use this data as our trading strategy, this is just an information sheet pertaining to these indicators to give you a better understanding of how you could use them on your platform to identify potential movements you can trade. Please always use confirmation of candle patterns and support and resistance as well as these indicators.... not the indicators alone.

**What Does Bollinger Band Mean?**
A band plotted two standard deviations away from a simple moving average, developed by famous technical trader John Bollinger.

![Bollinger Bands](chart.png)

*Chart by MetaStock Copyright © 2006 Investopedia.com*

**Investopedia explains Bollinger Band**
Because standard deviation is a measure of volatility, Bollinger bands adjust themselves to the market conditions. When the markets become more volatile, the bands widen (move further away from the average), and during less volatile periods, the bands contract (move closer to the average). The tightening of the bands is often used by technical traders as an early indication that the volatility is about to increase sharply.

This is one of the most popular technical analysis techniques. The closer the prices move to the upper band, the more overbought the market, and the closer the prices move to the lower band, the more oversold the market.

**What Does Standard Deviation Mean?**
1. A measure of the dispersion of a set of data from its mean. The more spread apart the data, the higher the deviation. Standard deviation is calculated as the square root of variance.
2. In finance, standard deviation is applied to the annual rate of return of an investment to measure the investment's volatility. Standard deviation is also known as historical volatility and is used by investors as a gauge for the amount of expected volatility.

**Investopedia explains Standard Deviation**
Standard deviation is a statistical measurement that sheds light on historical volatility. For example, a volatile stock will have a high standard deviation while the deviation of a stable blue chip stock will be lower. A large dispersion tells us how much the return on the fund is deviating from the expected normal returns.

**What Does Mean Mean?**
The simple mathematical average of a set of two or more numbers. The mean for a given set of numbers can be computed in more than one way, including the arithmetic mean method, which uses the sum of the numbers in the series, and the geometric mean method. However, all of the primary methods for computing a simple average of a normal number series produce the same approximate result most of the time.