

(B)asic

(A)thletic

(M)easurement

Do you have what it takes to reach the next level?



A basketball player in a red and yellow jersey is shown in a dynamic pose, dribbling a basketball. The player is wearing a red jersey with yellow accents and the word "odea" visible. The background is dark with some light effects. The word "Agenda" is written in large white letters to the right of the player.

Agenda

01 Problem

02 What is BAM?

03 Data

04 Insight/Recommendations



Numbers Game

3.5% of high school athletes transition to playing college basketball

01

The GAP

How do we measure “how an athlete stacks up against competition”

02

SAT equivalent for Basketball?

What if there was a standardized numerical score to measure strengths and weakness?

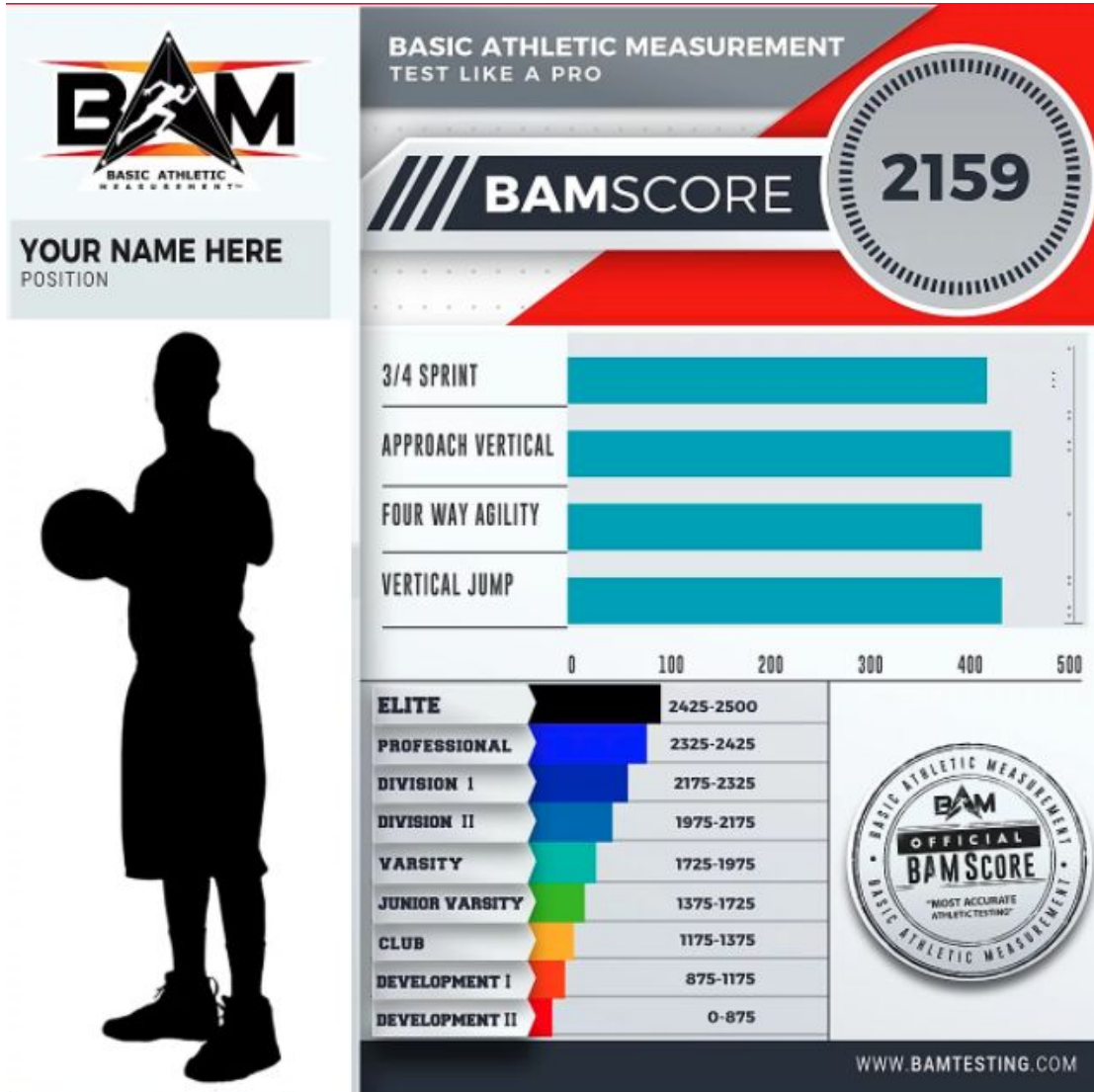
03

1) The Problem

BASKETBALL

High School > College

2) - BAM SCORE - Protocols (Athletic Tests)



01 $\frac{3}{4}$ Court Sprint

02 Approach Vertical

03 4 Way Agility

04 Vertical Jump

05 Reaction Shuttle



2) BAM Score - Anthros (Body Measurements)



Height

01

04

Reach

Weight

02

06

Hand Length

Body Composition

03

07

Hand Width

Wingspan

04





We asked Brett to help us understand the nitty gritty details about the tests performed, and what numbers athletes should be shooting for to really impress.

"WELL, THERE ARE SIX TESTS THAT ARE DONE AT THE NBA COMBINE. I WILL EXPLAIN THE BASICS OF EACH OF THEM FOR YOU."

1 3/4 COURT SPRINT

Recruits perform a 3/4 court sprint, which is from the baseline to the opposite free throw line, totaling 25 yards. It's kind of an odd test, in that because most metrics out there, internationally 20 meters is kind of the gold standard if you're doing comparables across disciplines. Football has a traditional 40 yard dash, and baseball has a 60 yard dash, but this is the one the NBA uses.

2 LANE AGILITY

In this test, recruits move around the NBA lane. It's a rectangle. They sprint, then defensive slide to their right, then pack-pedal, and defensive slide to their left. Finally, they reverse the steps back around the lane back to the place they started.

3 REACTIVE SHUTTLE

With specialized instruments, we measure the reactive time of an athlete and their quickness from one side of the key to the other. The athlete doesn't have to touch the line with his hand, but they do have to touch the line with their foot. They'll start in the middle of the paint (center of the key), our clock/technology will hold the athlete for a random count of three to eight seconds. They don't know how long it's going to be before it starts, and then a light on either the right or left side will go off, indicating which direction they need to move first. Once the light goes off, they'll quickly move the direction indicated by the light and touch the line. Then, they'll cross the key to touch the other side's line and finish back in the middle. This agility test is used by most professional sports to test agility.

4 VERTICAL WITH NO STEP

The next two tests are jump tests. We first do a typical counter movement jump, where they get in jump position, load, and then explode upward; just like they do in the NFL. There's no step or bunny hop. You drive off the floor. It's a counter movement - down and up.

5 VERTICAL MAX JUMP

The NBA has done the Max Jump for years. There's a 15-foot circle, with a measuring apparatus. The recruit needs to have both feet inside that circle when they start. They can approach the center and take off in any manner that they choose: one foot or two feet take off. The goal is to reach the max height possible. A machine called a Vertec is used for the vertical jump measurements. There are a few components that play into this jump to get an accurate "jump" measurement, such as getting an accurate overhead reach for each recruit.

6 BENCH PRESS

The gold standard in the gym is also the standard strength movement we use to assess upper body strength and muscle endurance under load. We use a standard 185lbs for max reps for the guys. Women should use 70% of their body weight."

Let's get down to brass tax. Rather than just giving you the tests, we wanted to provide the elite numbers that impress the coaches, universities and professional teams so you can see how you measure up.

It took some serious prodding and coaxing, but we finally dug out the numbers of the top 4 percentile for each measurement out of him. Have a friend or family member help you to ensure you collect correct results.

3/4 COURT SPRINT



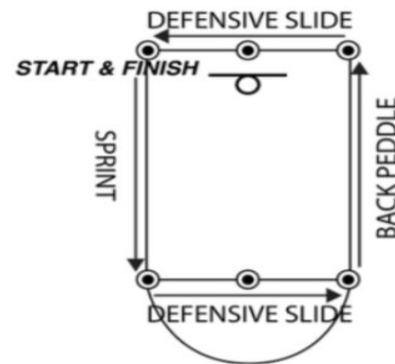
1 3/4 COURT SPRINT

Pro time to shoot for is under 3.1 seconds. Ladies, you should shoot for under 3.4 seconds.

4 VERTICAL WITH NO STEP

Pro height to shoot for is 37 inches for the guys, and 27 inches for ladies. Test Note: Using a pencil, smear the lead all over your middle finger on the hand you'll use and make a mark on the wall while reaching as high as you can while remaining flat footed. Once you've marked your reach, cover your finger again in pencil and jump as high as you can without taking a step. At the top of your jump, hit the wall to mark your height. Measure the distance between the two marks to calculate your vertical. *Clean the wall with soap and water to remove the marks after you've completed the test. You're welcome, mom.

LANE AGILITY



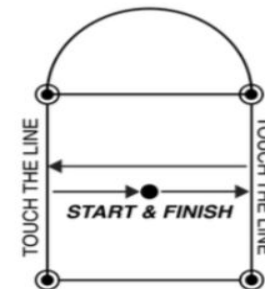
2 LANE AGILITY

Pro time to shoot for is 10.4 seconds for men, and 10.9 for the ladies.

5 VERTICAL MAX JUMP

Pro height to shoot for is 42 inches for the guys, and 34 inches for ladies. Test Note: Use the pencil trick to measure your height on this jump as well. Allow yourself a 7.5-foot approach to the wall for the jump.

REACTIVE SHUTTLE



3 REACTIVE SHUTTLE

Pro time to shoot for is 2.3 - 2.7 seconds for the guys, and 2.75 - 3 seconds for the ladies. Test Note: Stand in the center of the free throw line to begin. Have a friend point either direction. Then run and touch the line with your foot. Go to the opposite line and finish back at the middle.

6 BENCH PRESS

Pro reps to shoot for is 15 reps for men, and over 8 reps for ladies. Test Note: Warm up well before loading the weight. Have a spotter available and do as many reps as possible. The barbell must touch your chest, but do not bounce the weight off your chest. Remember, 185lbs for men, and 70% of bodyweight for women.

We're not saying that getting close to these numbers will score you a college scholarship or pro signing bonus, but it will help you know where you rank with to the pros.

In future issues, we will explain the ins and outs of how to improve your numbers while your working to build serious muscle for a balanced, functional body.

3) DATA

SAMPLE

DATA

14-18 Year old High School
Competitive Basketball Players
that want to play college
Basketball.

14~18yrs

High School
Basketball Players

	BAMid	Approach Vertical	Vertical Jump	3/4 Court sprint	4-Way agility	Reaction Shuttle	BAMScore	Wingspan	Reach	Height	Weight	Body Comp	Hand Length	Hand Width
0	1037	33.5	28.5	3.376	11.471	3.669	2003.0	72.75	94.0	70.00	174.4	9.8	7.50	8.25
1	656	30.5	21.5	3.486	12.114	3.355	1865.0	82.00	104.5	79.50	188.4	21.9	7.50	8.75
2	477	37.0	31.0	3.23	12.036	3.562	2005.0	81.50	99.0	74.00	196.5	13.9	9.00	9.50
3	1200	29.0	23.0	3.37	12.509	3.173	1902.0	79.50	101.0	77.50	205.0	10.6	8.25	9.25
4	1501	31.0	26.0	3.389	12.724	3.316	1903.0	77.00	101.5	78.00	180.0	15.4	8.00	10.00

4) Insight



Feature Importance

Reaction Shuttle
¾ Court Sprint
4 Way Agility

Modeling Insight

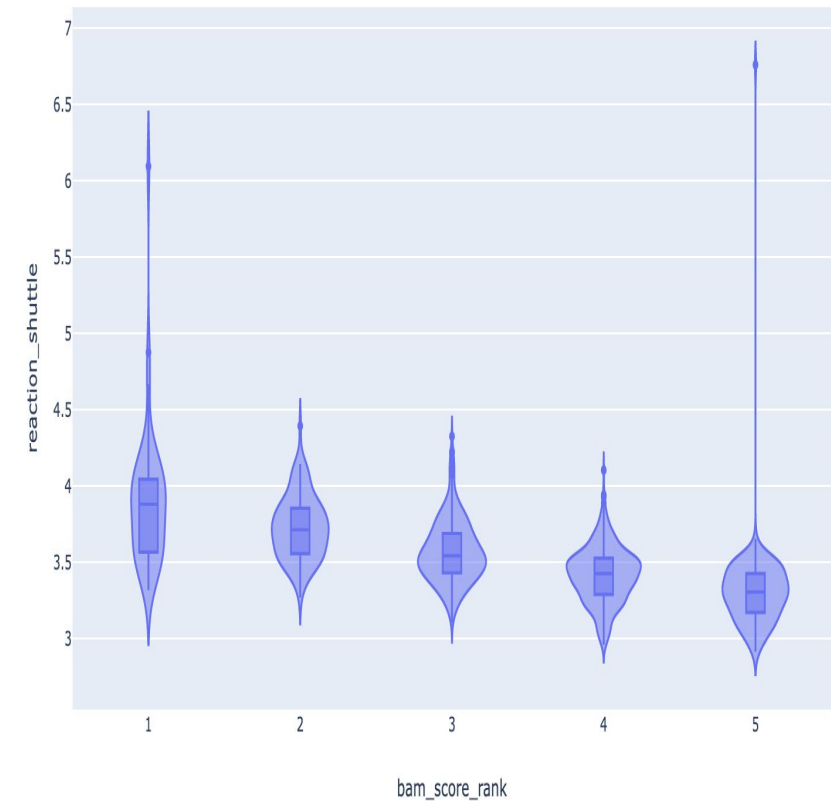
OLS + Random Forest = 60-61 % of the variance in bamscore is explained in the variance of the 5 best factors

Business Recs

Informing players and coaches to focus on improving agility performance metrics is the most important improvement to make in order to increase bam score and have a shot making it to the next level

cutting .1 seconds would make a big difference in improving bamscore

Reaction Shuttle with respect to Bam Score Rank



5) Future Work



Future Goals:

- 1) Add more data from 2021 + 2022
- 2) Use model to predict an actual Bamscore value needed to have a chance of making it to next level. How much do you have to increase one of your agility test scores to increase bamscore.
- 3) Leave out height - would make it interesting
- 4) Tune params even more to increase r^2 and make a better model
- 5) HAVE FUN and present my findings to the NBA and JR NBA



COMBINE CORNER

with BRETT BRUNGARDT

DREAMING OF BECOMING A COLLEGIATE, PROFESSIONAL OR OLYMPIC ATHLETE?

Each year, professional and collegiate sports pull a large group of talented athletes together to test their athletic abilities. These tests will help the organizations choose who of the group will be recruited. Brett is the man that these organizations



turn to, to administer these tests. The events where these tests take place are called "combines". These combine tests are watched by scouts, university coaches and professional team owners from all over the world. We had the pleasure of interviewing

the world's leading authority on combine training, Brett Brungardt. Now let's learn what metrics will help you see how you measure up against the best athletes in the world.

HOW DO YOU MEASURE UP AGAINST THE PROS?

When asked how he became the man for combine testing, Brett said, "I'd like to call myself an old coach. I was a strength and conditioning coach for 25 years. My educational background is a master's degree in Exercise Physiology. I coached 26 different sports as far as physical development and kind of niched myself into basketball in about the last ten years of my career coaching with the Dallas Mavericks and many other teams".

a great tool, Brett reminds us that, "It's not the end all, bear all. There's so much that these talented scouts and owners see with their eyes, that sometimes an instrument will never measure. But they do rely highly on our data." Brett tells the Iron Man readers to look at the combine tests like a job interview. "The teams come to evaluate potential employees."

Although there are many tests performed at combines to determine an athlete's talent, Brett explains what he measures. "Generally, combines look at certain components that they could subjectively, and objectively measure. Combines have an objective measurement of physical components, or performance parameters. And they measure speed, agility, reaction, power ratios, in combination with a skill's assessment."

Gone are the days of stop watches at this level. Highly integrated technology is used to measure these athletes. If you don't have to access all the equipment to see how you measure up, don't fret. Keep reading because we have some simple things for you to use so you can test your own abilities, and the best numbers to compare against.

Even though the combine tests are

SPEED

AGILITY

REACTION

POWER
RATIO



Will you make it?

