The Technical Hiring Playbook

Proven strategies to make the right hires, faster
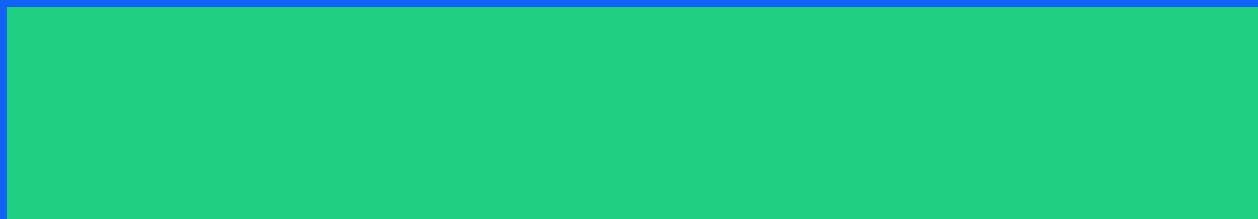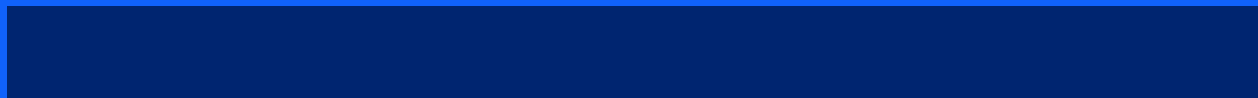
CodeSignal

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Introduction:

Why your tech hiring process must change

It's a complicated time to be hiring software engineers. Companies today need a hiring strategy that is agile and adaptable to shifting, unstable market conditions. At the same time, demand for technical talent—especially engineers with skills in AI and ML—continues to grow. The US Bureau of Labor Statistics expects demand for software developers to increase by 25 percent by 2032, far outpacing the average growth rate of 5 percent for other occupations.

Together, these factors make technical hiring today more challenging than it should be. Engineers are stretched thin by spending too much time interviewing unqualified candidates, resource-strapped recruiting teams struggle to source qualified talent for AI and other specialized engineering roles, and candidates themselves become frustrated with what's often a cumbersome recruiting process.

Leveraging our experience working with top companies hiring tech talent today—like Anthropic, Meta, and CapitalOne—CodeSignal has put together this playbook of best practices for technical hiring that will give your company a competitive edge in today's shifting job market.

The Technical Hiring Playbook prepares you to improve recruiting processes at your organization to hire the right candidates with the right skills and slash engineering time spent on recruiting—all while prioritizing agility and adaptability to change.

By the numbers: engineering demand today

63%
Percent of senior executives concerned about the shortage of engineering talent[1]

1.4 mil
Number of unfilled positions for software engineers in the US[2]

49 days
Average time-to-fill for engineering roles[3]

86%
Percent of the total cost per engineering hire incurred by the engineering team[4]
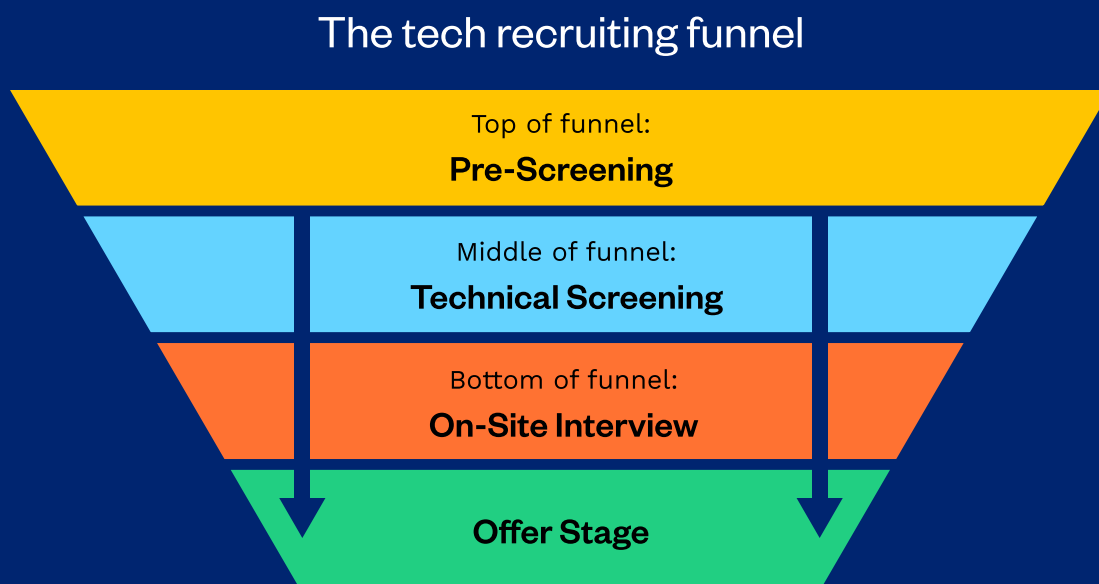
40 hrs
Average number of engineer hours spent interviewing and screening candidates to fill a single engineering role[4]

What you'll learn

This playbook will empower you to transform your technical recruiting processes to deliver the top talent your company needs, fast.

You'll learn how to improve your technical recruiting processes for **two groups of tech talent** with distinctive needs: junior or early career talent, and specialized or senior-level talent. While reqs for junior, intern, and early career developer roles often bring in a high volume of inbound applicants, those for senior-level or specialized roles often attract a lower volume of qualified candidates and require a different recruiting approach.

We'll break down our recommendations for these two groups into 6 plays: best practices for **top of the funnel, middle of the funnel,** and **bottom of the funnel**.

The tech recruiting funnel

Top of funnel:
Pre-Screening

Middle of funnel:
Technical Screening

Bottom of funnel:
On-Site Interview

Offer Stage

For hiring **early career talent**, we'll walk you through:

01.
Screening for interns and early career hires (high volume recruiting)

02.
Building relationships with your candidates at the mid-funnel stage

03.
Assessing real-world troubleshooting skills and team fit in the on-site interview

And for hiring **specialized and senior-level talent,** we'll lead you through best practices in:

01.

Competing for experienced and specialized engineering talent (sourced talent)

02.

Streamlining the technical screen to save engineering time

03.

Digging deeper into candidates' problem-solving skills in the on-site interview

At the conclusion of this guide, we bring it all together to show you what an optimized end-to-end technical hiring process looks like and the results one large tech company has seen by implementing these best practices.

Let's get started.

Best practices for hiring early career developers

Top of funnel play:
Screen for a strong foundation of technical skills

When you're hiring for junior-level or early career developer roles, managing applicants at the top of the funnel can be a daunting task (*we see you, university recruiters!*). In the tech industry, a single job posting can result in hundreds or even thousands of applications. Or, if you're Google, millions. They receive over 3 million applications per year and have a hire rate of just 0.2 percent.[5]

So what's the best way for companies to find great future employees among this high volume of applications?

Top of funnel
Research-backed technical skills screening

Traditional approach:
Resume review

Many companies choose to go with manual or ATS-assisted **resume reviews** to screen applicants at the top of the funnel. When screening manually, recruiters spend an average of 6 seconds per resume and pick out the 4 to 5 percent of applicants they believe are most qualified for the position.[6] The resume review process results in rejection of over 98 percent of applications, on average.[7]

In an ideal world, recruiting teams would have the capacity to thoroughly review each resume submitted and hold a conversation with each applicant to gain a holistic understanding of their qualifications for the job. The reality, however, is that companies need to sift through a large volume of applications, fast, to narrow down their pool of candidates to interview.

Resumes, bias, and the rise of self-taught developers:

It's well documented that resume review is subject to a high degree of bias and subjectivity. Even highly trained recruiters have **unconscious biases** that may shape how they evaluate a resume.

One example: people tend to notice educational institutions that are prestigious or which they themselves attended, opening up room for bias toward these candidates.[8] This is especially problematic today, when many of the most highly-skilled developers attended less prestigious universities or, increasingly, learned to code through a bootcamp or with free online resources.

A recent study of new grad developers found that some of the best technical talent, when measured by objective coding skills, comes from universities that are often overlooked by university recruiting teams: Stony Brook University and Arizona State University, for instance, are among the top schools named in the report.

Best practice:
Top-of-funnel skills screening

[Skills screening](#) provides a more objective measure of a candidate's qualifications, rather than the subjective impression of the person who reviews their resume. While bias can still creep into other parts of the recruiting process, objective skills screening limits the extent to which unconscious bias can shape decision-making at the top of the funnel.[9] It also allows recruiting teams to identify top candidates who have non-traditional employment or educational backgrounds.

Research-backed skills screening is used at the top of the funnel to evaluate core programming skills shared across many roles—especially junior-level roles. Pre-built screens are developed, validated, and maintained by the vendor, and can save engineering teams time they might have spent developing a custom assessment or conducting a technical phone screen.

Many assessment vendors also [integrate with applicant tracking systems (ATS)](#). Here's what to look for in an ATS integration with a tech hiring solution:

Can you send pre-screens automatically from the ATS?

This saves time for your recruiting team by making it easy for them to send assessment invitations to candidates in bulk.

Can you view assessment results in the ATS?

This allows recruiters to quickly sort through candidates who they want to advance to the next round, or easily dig deeper into a candidate's results.

Can you schedule interviews from the ATS?

A comprehensive tech hiring solution should include both pre-screen and live interview solutions; both solutions should integrate with your ATS for a consistent experience for both candidate and recruiters.

Key takeaway

Our recommendation is to send **research-backed skills screens** to all intern and junior-level applicants to efficiently identify top talent among a large pool of applicants and slash engineering time spent interviewing unqualified candidates.

Middle of funnel play:
Build relationships
with your candidates

Using a research-backed skills screen at the top of the funnel gives recruiting teams a strong signal of which candidates possess the technical skills needed to succeed for the job. It also **saves recruiters hundreds of hours** they would have spent poring over resumes.

With a clear view of who has the skills for the job and time freed up by eliminating manual resume review, we recommend that you **have a recruiter reach out** to do what they do best: build connections with junior-level candidates, gauge their interest, and assess for culture fit. Building connections with top-scoring candidates will help move them along more quickly in the hiring process and create a positive candidate experience.

Depending on your company's applicant volume and [hiring bar,](#) you may also use the middle of the funnel stage to **conduct additional screening** of candidates who didn't quite meet your technical bar but may still turn out to be good fits.

3 tips for building connections with junior-level candidates

You've identified a candidate with strong technical skills and are excited to move them onto the next stage. What can a recruiter do at this stage to get this candidate excited about the role, so you can prevent drop-off and increase the likelihood of offer acceptance? Here are 3 tips:

01. ### Connect with candidates on their purpose.
Learning what a candidate cares about and what drives them in their work not only helps you gauge their culture fit—it also shows them that you care about their career aspirations.

02. ### Communicate transparently and often about the recruiting timeline.
Ease candidates' anxiety about next steps and when they can expect to hear back from your team by erring on the side of over-communicating with them. They will appreciate your attentiveness and personalized outreach.

03. ### Use automated scheduling tools to free up time to connect.
If you spend a quarter of your day scheduling interviews and on-sites, you likely won't have time to engage in personalized outreach to top candidates. Let tools like GoodTime handle repetitive tasks so you can focus on what you do best.

Key takeaway

Don't underestimate the power of building meaningful connections with your top candidates to improve candidate experience and boost offer acceptance rates.

Case study:
Slashing time-to-hire for junior dev roles by 75%

A top North American tech company was looking to streamline their university recruiting program to reduce the amount of time engineers spent interviewing candidates and to move candidates through the recruiting funnel more quickly.

Since implementing CodeSignal's General Coding Framework at the top of the funnel for their university recruitment, the company's **time-to-fill dropped from 56 days to 14 days** over the course of just 6 months.

Bottom of funnel play:
Assess real-world troubleshooting skills and team fit

Bottom of funnel
Troubleshooting skills & team fit, and offer stage

You now have a select pool of qualified candidates that have moved to the on-site stage of your recruiting process. How do you make the most of this touchpoint to ensure your interviewers home in on the candidates best suited for the job while maintaining a positive candidate experience?

The answer: structured interviews. Structured interviews ensure fairness and consistency when conducting virtual or in-person on-site interviews. This is a win-win for both hiring teams and candidates.

Tips for conducting structured interviews

Here are a few ways that structured interviews improve candidate experience in technical on-sites:

01. Reducing bias in the interviewing process by creating a consistent interview process for all candidates.[10] Candidates who go through a structured interview process will feel confident they are being assessed fairly.

02. Improving interviewer preparedness. Interviewers who are prepared for the interview and aligned on their roles during the interview will leave a much better impression with a candidate than interviewers who are obviously "winging it."

03. Encouraging interviewers to ask questions in a thoughtful progression. Research shows that question order matters for a candidate's performance and experience in an interview.[11] Starting with easier questions helps put the candidate at ease and warm them up for the more challenging questions you'll ask later.
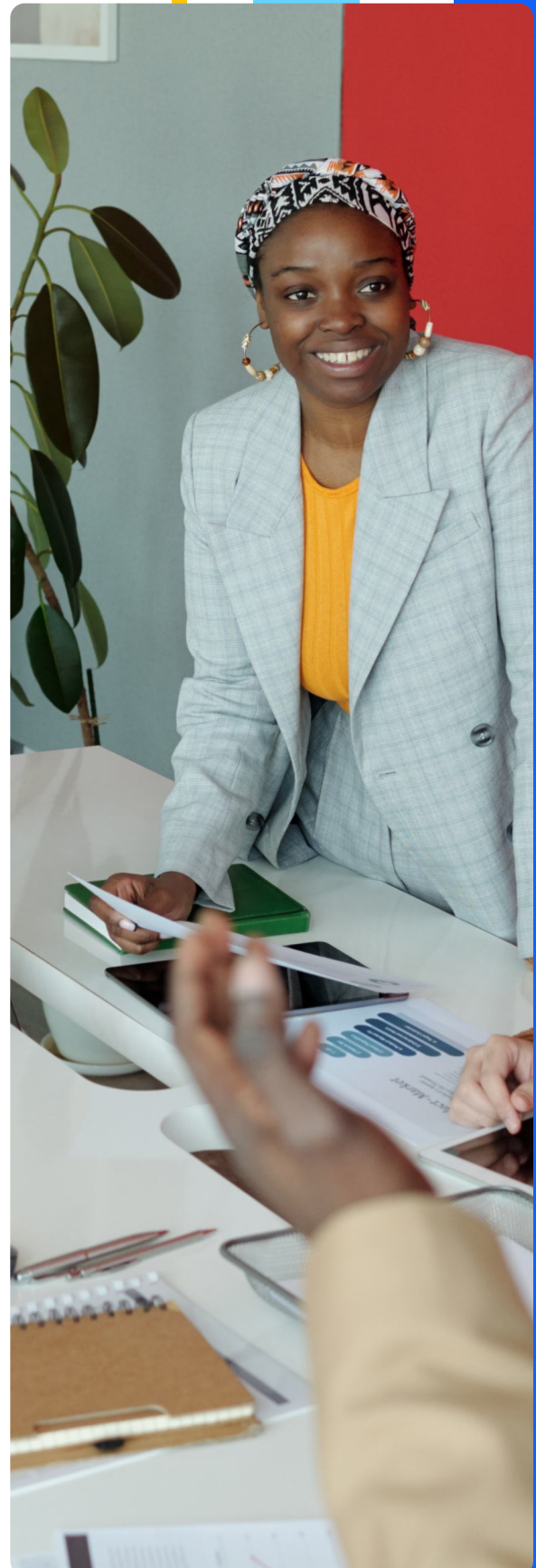
For junior-level roles where **core programming skills** matter more than specialized knowledge of languages or frameworks, we recommend using the technical on-site to dig into two areas best assessed by human interviewers: **real-world troubleshooting skills** and **team fit**.

Both candidates and interviewers have the best experience when they can collaborate and talk through a problem together. Consider coding interview tools that allow interviewers to quickly pull up real-world programming problems for candidates to solve, and that make it easy for interviewers to assess candidates' communication and collaboration skills as they work through the problem together. Even better if the tool allows interviewers to pull up a candidate's pre-screen assessment during the live interview to review and build on their previous work. Candidates will appreciate and perform best in a platform that provides a comfortable, realistic development environment.

Key takeaway

Conduct your on-site technical interviews in a **realistic development environment** that allows live collaboration and troubleshooting opportunities while providing a top-notch candidate experience.

Case study:
Saving hundreds of engineering hours with top-of-funnel skills screening

A high-growth technology startup that recently went public decided to implement CodeSignal's General Coding Framework, the leading technical skills screening solution for early-career talent, after determining that their in-house assessment solutions were limiting their ability to scale their engineering team quickly. They chose CodeSignal's Hire suite that included research-backed screens to accurately identify qualified talent at the top of the funnel.

The company saw the results below within 10 months of implementing CodeSignal.

99%
Reduction in engineering time spent reviewing assessment results

59%
Decrease in time-to-hire

31%
Increase in onsite-to-hire ratio

Best practices for hiring specialized and senior-level engineering talent

Top of funnel play:
Screen for role fit for senior-level candidates

While a junior-level developer job opening can bring in thousands of applicants, the situation is different for senior-level and specialized technical roles. Today, companies are in **steep competition** to attract and hire top candidates for AI engineers and other specialized roles. As a result, they take much longer to fill than junior-level roles and rely heavily on recruiting teams sourcing candidates.[12] To win these candidates, you need to move faster and provide a better candidate experience than the other companies seeking this talent.

In your initial outreach to these candidates, your task as a recruiter is to **ensure alignment** and **build connections** that get them excited about the role, your company, and your recruiting process.

Tips for coaching sourcers

From Elliott Garms
Co-Founder at humanpredictions

A generic form email stating "we invite you to apply" likely won't grab the attention and interest of top senior-level and specialized technical talent. Here's what you should do to stand out in your passive candidates' inboxes:

Reach out to prospects about more than just job opportunities.
Ask prospects about the things that matter to them: events they've attended, conferences where they've presented, and the latest research in their field. This shows prospects that you've taken the time to really get to know them—and gives them a compelling reason to respond to you.

Do personalized and data-driven outreach.
Rather than spamming prospects on LinkedIn, send highly personal messages via email or LinkedIn to get consistently higher response rates than templated messages.

Do you offer remote work options?
Use that to sell the role and expand the geographic reach of your talent search. Without the limitation of geography, sourcers can identify prospects who are not just a good fit for the role, but a great fit.

Key takeaway

Recruiters should **develop connections** with candidates early in the recruiting process to get them excited about the opportunity and earn their trust.

Middle of funnel play:
Streamline the technical screen to save engineering time
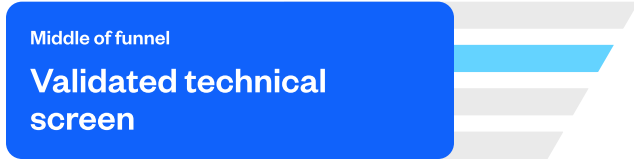
For recruiting teams, the **technical screen** is arguably the most challenging stage of hiring specialized and senior-level developers. On the one hand, recruiters need to create an exceptional candidate experience and woo top talent to prevent candidate drop-off. On the other hand, they need to home in on candidates who are the best match for the job in terms of both technical qualifications and cultural fit.

We've observed two main ways that companies navigate this stage of the recruiting funnel.

Traditional approach:
Engineering-driven technical phone screen

A common approach for companies recruiting experienced engineers is to conduct an engineering-led technical phone screen with candidates who pass the initial screening. This approach requires one or more engineers (often the most valuable, senior-level engineers) to conduct an **hour-long interview** with each candidate who makes it to this stage. It also requires significant **prep time** for engineers to develop interview questions and calibrate scoring across interviewers.

Disadvantages of the traditional, engineering-led technical phone screen are:

Significant investment of engineering time spent on conducting mid-funnel interviews (over 1 hour per interview, plus prep time)

Bottlenecks for recruiting teams and candidates, who often need to wait a week or more for engineers to have time to conduct and debrief interviews

Inconsistent candidate evaluation & **bias** across interviewers

Low-quality signal of candidates' job-relevant skills when interview is not conducted in a realistic development environment

Best practice:
Validated technical screens

Leading companies are increasingly turning to asynchronous versions of the technical phone screen as a tool for reliably identifying top talent—including for specialized and senior-level hires—that replaces the need for engineers to dedicate a significant amount of time to recruiting.

Compared to traditional phone screens, **best-in-class technical screens** offer a number of benefits for both companies and candidates:

Companies obtain a **stronger signal** of a candidate's job-relevant skills by switching to a validated, asynchronous technical screen backed by thousands of hours of research.

Companies also **save hundreds of engineering hours** previously spent creating, conducting, and scoring traditional phone screens manually.

Candidates can complete the tech screen in a **familiar and comfortable** development environment that simulates real development work and uses questions relevant to specific roles, including ML engineering, front-end, full-stack, data science, and others.

Because a validated, asynchronous tech screen is scored automatically, candidates will **hear back sooner** than they would with a traditional phone screen, allowing qualified candidates to advance more quickly through the hiring process.

The time your recruiting team invested in **building a relationship** with the candidate early in the recruiting process pays dividends here: candidates will go into the tech screen knowing what to expect and why it's being asked of them in place of (not in addition to) a traditional phone interview.

Managing the use of AI in assessments

Since the public release of ChatGPT in 2022, some candidates have seen generative AI as a resource they can use to help them complete technical assessments. For some employers, this causes alarm: they want to see what their candidates can do without the use of AI, and they are interested in ways to detect and prevent the use of AI tools in their assessments. For others, AI represents a new way of doing software development, and employers want to see how candidates make successful use of AI tools to do the job.

For companies looking to **detect and deter** candidates's use of AI in assessments, look for a pre-screening tool that:

01.
Dissects each solution to identify patterns that may indicate AI-generated code

02.
Uses telemetry to reliably identify activities correlated with use of generative AI or other unauthorized resources

03.
Synthesizes these factors to assign a trust level to each result, giving you confidence in candidates' results and flagging those that require further review

For companies that **encourage candidates to use AI**, look for a pre-screening tool that:

Includes a build-in AI coding assistant that gives candidates feedback on their code, helps them debug, and can assist with looking up documentation

Offers a complete recording of the candidate's interaction with the AI assistant to allow hiring teams to dig deeper into the candidate's ability to use these tools effectively

Key takeaway

When you replace the traditional, engineering-led technical phone screen with a **validated technical screen** at the middle of the funnel, it's a win-win for candidates and engineering hiring teams.

Bottom of funnel play:
Dig deeper into candidates' problem-solving skills

After the assessment stage, you'll have narrowed down your pool of candidates to those who've proven they have the technical chops to succeed on the job. The purpose of the on-site interview, then, is to **provide engineering hiring teams an opportunity to build a human connection with the top candidates** and gain a deeper understanding of their problem-solving skills.

When interviewing experienced developers, our advice is to go beyond the more fundamental coding tasks in the on-site interview. Here are some skills you should assess for instead:

Depth of experience working with a given framework	System design expertise using a virtual whiteboard	Collaboration and communication skills	Ability to respond to new information while problem-solving

Try to strike a balance between using structured interviews with predefined questions (which ensure consistent evaluation across candidates and reduce bias) and allowing time for interviewers to dig deeper into a candidate's reasoning and problem-solving skills.

Key takeaway

Make sure your on-site interview digs into specialized and advanced problem-solving skills; it should provide **new information** about a candidate's skills that could not be inferred from their assessment result, which has already predicted their technical abilities.

Case study:

Improving on-site to offer rate with a validated technical screen

A **leading enterprise tech company** determined that their engineering teams were spending too much time conducting phone screens and developing custom coding tasks, so they pivoted to a new approach: CodeSignal's Industry Coding Framework—a validated, asynchronous technical screen—to replace their traditional technical phone screen. After an A/B test, they found that the use of an asynchronous assessment produced better results without an increase in candidate drop-off.

They have seen the following results within 3 months by replacing their technical phone screen with a validated tech screen built and maintained by CodeSignal:

93%
Percentage of candidates invited who completed the assessment

12,000+
Hours saved, the annual equivalent of nearly 6 full-time engineers

65%
Improvement in on-site to offer rate

Conclusion

This playbook has taken you through research-based best practices for optimizing your technical recruiting funnel for junior-level, senior-level, and specialized hires. For both of these types of hires, we've broken down our recommendations by each level of the funnel. Here's a summary of the key takeaways from our 6 plays:

For recruiting junior or early-career developers:

01.

Send research-backed assessments to all junior-level applicants as your first stage of screening to efficiently identify top talent among a large pool of applicants.

02.

Don't underestimate the power of building meaningful connections with your top candidates at the mid-funnel stage to improve your offer acceptance rate.

03.

Conduct your on-site technical interviews in a realistic development environment that allows live collaboration and troubleshooting opportunities.

For recruiting specialized and senior-level developers:

01.

Have recruiters and sourcers develop connections with candidates early in the recruiting process to earn candidates' trust and buy-in.

02.

Replace the traditional technical phone screen with a validated technical screen at the middle of the funnel to create a win-win scenario for candidates and engineering hiring teams.
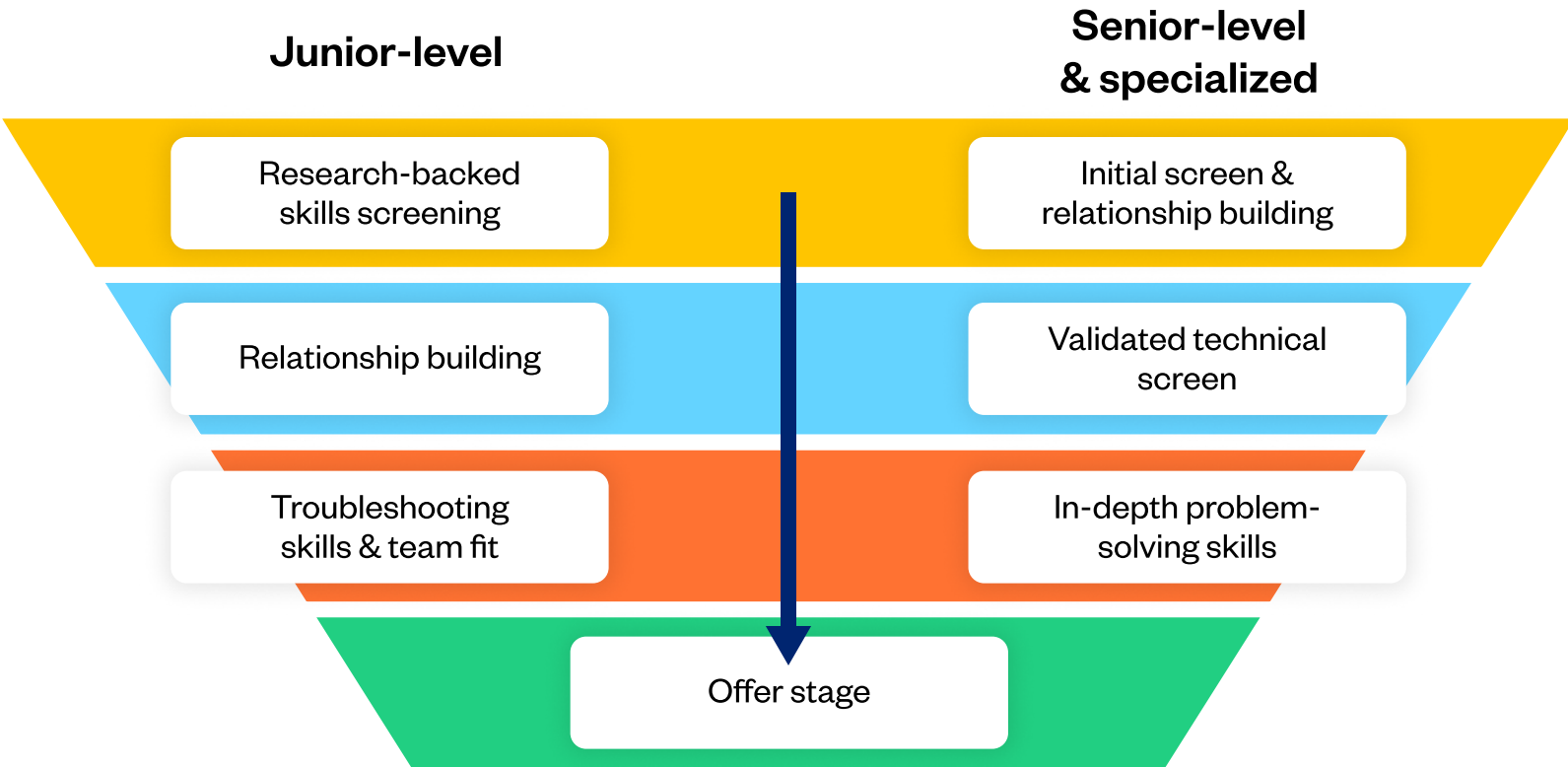
03.

Make sure your on-site interview digs into the specialized and advanced problem-solving skills required for specialized and senior-level roles.

Optimized tech recruiting funnel

The graphic below provides an overview of these best practices for each stage of the funnel:

Junior-level

Senior-level & specialized

Research-backed skills screening		Initial screen & relationship building
Relationship building		Validated technical screen
Troubleshooting skills & team fit		In-depth problem-solving skills
	Offer stage	

When you optimize your recruiting funnel for technical hiring, you can expect to see benefits for both your recruiting and engineering teams:

⬇️ Reduced time spent screening and interviewing unqualified candidates

⬇️ Reduced bias by using objective and research-backed skills screening solutions

⬆️ Increased quality of candidates in your talent pipeline

⬆️ Improved candidate experience and offer acceptance rates for technical hires at every level

Ready to implement these plays at your organization? Talk with our team of experts to quantify the savings your organization can expect by implementing best practices for technical hiring. **Schedule a call today.**

Appendix: References and resources

Want to learn more about best practices for developer recruiting and interviewing? Check out the research below that informed our best practices.

1. [Analyzing The Software Engineer Shortage](#), CNBC, 2021

2. [Software Developer Shortage in the US and Global Tech Talent Shortage in 2022](#), Daxx, 2022

3. [Can you wait 49 days? Why getting hired takes so long in engineering](#), LinkedIn, 2021

4. [You probably don't factor in engineering time when calculating cost per hire. Here's why you really should](#), Interviewing.io, 2019

5. [Here's how many Google interviews it takes to hire a Googler](#), CNBC, 2019

6. [2021 HR Statistics: Job Search, Hiring, Recruiting & Interviews](#), Zety, 2021

7. [50 HR and Recruiting Stats That Make You Think](#), Glassdoor, 2021

8. [How Unconscious Biases May Impact Reviewing a Resume](#), University of California, 2016

9. [Battling Bias in Hiring and Opening Up More Opportunities for Women and Minorities With an Objective Framework Based Assessment](#), Interesting Engineering, 2019

10. [How unconscious bias affects employee experience](#), Greenhouse, 2022

11. [Asking Questions: Techniques for Semistructured Interviews](#), Rutgers University, 2002

12. [When to Hire Junior vs. Senior Level Employees](#), Fetcher, 2021